



79601-7270 Sequence Mapping v2 -03-25-04.ST25  
SEQUENCE LISTING

<110> Profigen Inc.

<120> Cloning of Cytochrome P450 Genes from Tobacco

<130> 79601

<140> US 10/686947

<141> 2003-10-16

<150> US 10/387346

<151> 2003-03-12

<160> 298

<170> PatentIn version 3.2

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<211> 207

<212> DNA

<213> NICOTIANATABACUM

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gtaacttaca tgaaaaatcc aatacaagct attccaactc caagattgcc tgcacacttg 180  
tatggacgtg tgccagtgga tatgtaa 207

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<211> 68

<212> PRT

<213> NICOTIANATABACUM

<400> 2

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His His Phe Thr Trp Ala Pro Ala Pro Gly Val Asn Pro Glu Asp Ile  
20 25 30

Asp Leu Glu Glu Ser Pro Gly Thr Val Thr Tyr Met Lys Asn Pro Ile  
35 40 45

Gln Ala Ile Pro Thr Pro Arg Leu Pro Ala His Leu Tyr Gly Arg Val  
50 55 60

Pro Val Asp Met  
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<210> 3

<211> 207

<212> DNA

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&lt;213&gt; NICOTIANATABACUM

&lt;400&gt; 3

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&lt;210&gt; 4

&lt;211&gt; 68

&lt;212&gt; PRT

&lt;213&gt; NICOTIANATABACUM

&lt;400&gt; 4

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1          5          10          15
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His His Phe Thr Trp Ala Pro Pro Pro Gly Val Asn Pro Glu Asn Ile
          20          25          30
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Asp Leu Glu Glu Ser Pro Gly Thr Val Thr Tyr Met Lys Asn Pro Ile
          35          40          45
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Gln Ala Ile Pro Thr Pro Arg Leu Pro Ala His Leu Tyr Gly Arg Val
          50          55          60
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Pro Val Asp Met
65
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&lt;210&gt; 5

&lt;211&gt; 183

&lt;212&gt; DNA

&lt;213&gt; NICOTIANATABACUM

&lt;400&gt; 5

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tttgcaacta cgaccaatga gcctttggat atgaaacaag gtgtgggttt aactttacca      120
aagaagactg atgttgaagt gctaattaca cctgccttc ctcctacgct ttatcaatat      180
taa                                           183
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&lt;210&gt; 6

&lt;211&gt; 60

&lt;212&gt; PRT

&lt;213&gt; NICOTIANATABACUM

&lt;400&gt; 6

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Met Asn Tyr Ser Leu Gln Val Glu His Leu Ser Ile Ala His Met Ile
1          5          10          15
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Gln Gly Phe Ser Phe Ala Thr Thr Thr Asn Glu Pro Leu Asp Met Lys  
20 25 30

Gln Gly Val Gly Leu Thr Leu Pro Lys Lys Thr Asp Val Glu Val Leu  
35 40 45

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<213> NICOTIANATABACUM

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Ile Ile Leu His Gly Leu Arg Pro Arg Gly Leu Thr Arg Arg Ile Leu  
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Thr Trp Arg Arg Ala Leu Glu Gln  
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<211> 62

## 79601-7270 Sequence Listing v2 -03-25-04.ST25

&lt;212&gt; PRT

&lt;213&gt; NICOTIANATABACUM

&lt;400&gt; 10

Glu Gly Leu Ala Val Arg Met Val Ala Leu Ser Leu Gly Cys Ile Ile  
 1 5 10 15

Gln Cys Phe Asp Trp Gln Arg Ile Gly Glu Glu Leu Val Asp Met Thr  
 20 25 30

Glu Gly Thr Gly Leu Thr Leu Pro Lys Ala Gln Pro Leu Val Ala Lys  
 35 40 45

Cys Ser Pro Arg Pro Lys Met Ala Asn Leu Leu Ser Gln Ile  
 50 55 60

&lt;210&gt; 11

&lt;211&gt; 189

&lt;212&gt; DNA

&lt;213&gt; NICOTIANATABACUM

&lt;400&gt; 11

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tggcaacgac ttggggaagg attggtgat aagactgaag gaactggact tactttgcct 120

aaagctcaac ctttagtggc caagtgtagc ccacgaccta taatggctaa tcttctttct 180

cagatttga 189

&lt;210&gt; 12

&lt;211&gt; 62

&lt;212&gt; PRT

&lt;213&gt; NICOTIANATABACUM

&lt;400&gt; 12

Glu Gly Leu Ala Ile Arg Met Val Ala Leu Ser Leu Gly Cys Ile Ile  
 1 5 10 15

Gln Cys Phe Asp Trp Gln Arg Leu Gly Glu Gly Leu Val Asp Lys Thr  
 20 25 30

Glu Gly Thr Gly Leu Thr Leu Pro Lys Ala Gln Pro Leu Val Ala Lys  
 35 40 45

Cys Ser Pro Arg Pro Ile Met Ala Asn Leu Leu Ser Gln Ile  
 50 55 60

&lt;210&gt; 13

&lt;211&gt; 183

&lt;212&gt; DNA

&lt;213&gt; NICOTIANATABACUM



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 <213> NICOTIANATABACUM

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 Glu Gly Val Gly Val Thr Leu Pro Lys Val Asn Gln Val Glu Val Leu  
 35 40 45  
 Ile Thr Pro Arg Leu Pro Ser Lys Leu Tyr Leu Phe  
 50 55 60

<210> 15  
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 <212> DNA  
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 <212> PRT  
 <213> NICOTIANATABACUM

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 1 5 10 15  
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 20 25 30  
 Glu Gly Val Gly Val Thr Leu Pro Lys Val Asn Gln Val Glu Val Leu  
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Ile Thr Pro Arg Leu Pro Ser Lys Leu Tyr Leu  
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<210> 17  
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<210> 18  
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Ile Asn Phe Ala Thr Leu Val Thr His Leu Thr Phe Gly Arg Leu Leu  
1 5 10 15

Gln Gly Phe Asp Phe Ser Thr Pro Ser Asn Thr Pro Ile Asp Met Thr  
20 25 30

Glu Gly Val Gly Val Thr Leu Pro Lys Val Asn Gln Val Glu Val Leu  
35 40 45

Ile Ser Pro Arg Leu Pro Ser Lys Leu Tyr Val Phe  
50 55 60

<210> 19  
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<212> DNA  
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ctccacattt tgaagcattc caccattgtg ttgaaaccaa ggtctttctg a 171

<210> 20  
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<212> PRT  
<213> NICOTIANATABACUM

## 79601-7270 Sequence Listing v2 -03-25-04.ST25

&lt;400&gt; 20

Ile Ile Leu Ala Leu Pro Ile Leu Gly Ile Thr Leu Gly Arg Leu Val  
 1 5 10 15

Gln Asn Phe Glu Leu Leu Pro Pro Pro Gly Gln Ser Lys Leu Asp Thr  
 20 25 30

Thr Glu Lys Gly Gly Gln Phe Ser Leu His Ile Leu Lys His Ser Thr  
 35 40 45

Ile Val Leu Lys Pro Arg Ser Phe  
 50 55

&lt;210&gt; 21

&lt;211&gt; 171

&lt;212&gt; DNA

&lt;213&gt; NICOTIANATABACUM

&lt;400&gt; 21

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ctgttgcctc ctccaggcca gtcgaagctc gacaccacag agaaagggtg acagttcagt 120

ctccatattt tgaagcattc caccattgtg ttgaaaccaa ggtcttgctg a 171

&lt;210&gt; 22

&lt;211&gt; 56

&lt;212&gt; PRT

&lt;213&gt; NICOTIANATABACUM

&lt;400&gt; 22

Ile Ile Leu Ala Leu Pro Ile Leu Gly Ile Thr Leu Gly Arg Leu Val  
 1 5 10 15

Gln Asn Phe Glu Leu Leu Pro Pro Pro Gly Gln Ser Lys Leu Asp Thr  
 20 25 30

Thr Glu Lys Gly Gly Gln Phe Ser Leu His Ile Leu Lys His Ser Thr  
 35 40 45

Ile Val Leu Lys Pro Arg Ser Cys  
 50 55

&lt;210&gt; 23

&lt;211&gt; 172

&lt;212&gt; DNA

&lt;213&gt; NICOTIANATABACUM

&lt;400&gt; 23

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ttgggagtta ctttttggaa tgaaaaaaga agacattgac acaaacgccca ggcctggaat 120

## 79601-7270 Sequence Listing v2 -03-25-04.ST25

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<210> 24  
 <211> 63  
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<400> 24

Ile Ala Leu Gly Val Ala Ser Met Glu Leu Ala Leu Ser Asn Leu Leu  
 1 5 10 15

Tyr Ala Phe Asp Trp Glu Leu Pro Phe Gly Met Lys Lys Glu Asp Ile  
 20 25 30

Asp Thr Asn Ala Arg Pro Gly Ile Thr Met His Lys Lys Asn Glu Leu  
 35 40 45

Tyr Leu Ile Pro Lys Asn Tyr Leu Pro Ser Lys Leu Tyr Leu Phe  
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 <212> DNA  
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<210> 26  
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<400> 26

Ile Ala Leu Gly Val Ala Ser Met Glu Leu Ala Leu Ser Asn Leu Leu  
 1 5 10 15

Tyr Ala Phe Asp Trp Glu Leu Pro Tyr Gly Val Lys Lys Glu Asn Ile  
 20 25 30

Asp Thr Asn Val Arg Pro Gly Ile Thr Met His Lys Lys Asn Glu Leu  
 35 40 45

Cys Leu Ile Pro Arg Asn Tyr Leu  
 50 55

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<210> 27  
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<400> 28  
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 Tyr Ala Phe Asp Trp Glu Leu Pro Tyr Gly Val Lys Lys Glu Asp Ile  
 20 25 30  
 Asp Thr Asn Val Arg Pro Gly Ile Ala Met His Lys Lys Asn Glu Leu  
 35 40 45  
 Cys Leu Val Pro Lys Asn Tyr Leu  
 50 55

<210> 29  
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 <211> 66  
 <212> PRT  
 <213> NICOTIANATABACUM

<400> 30  
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 1 5 10 15

Tyr Ala Phe Asp Trp Glu Leu Pro Tyr Gly Val Lys Lys Glu Asp Ile  
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20

25

30

Asp Thr Asn Val Arg Pro Gly Ile Ala Met His Lys Lys Asn Glu Leu  
 35 40 45

Cys Leu Val Pro Lys Lys Leu Phe Ile Asn Tyr Ile Gly Thr Trp Ile  
 50 55 60

Ser Cys  
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<210> 31  
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 actgccgcta gaaaaagtga cctttacttg gttgcgactc cttatcaacc tcctcaaaac 180  
 tga 183

<210> 32  
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 <212> PRT  
 <213> NICOTIANATABACUM

<400> 32

Ile Ser Phe Gly Leu Ala Asn Ala Tyr Leu Pro Leu Ala Gln Leu Leu  
 1 5 10 15

Tyr His Phe Asp Trp Glu Leu Pro Thr Gly Ile Lys Pro Ser Asp Leu  
 20 25 30

Asp Leu Thr Glu Leu Val Gly Val Thr Ala Ala Arg Lys Ser Asp Leu  
 35 40 45

Tyr Leu Val Ala Thr Pro Tyr Gln Pro Pro Gln Asn  
 50 55 60

<210> 33  
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## 79601-7270 Sequence Listing v2 -03-25-04.ST25

actgccgcta gaaaaagtga cctttacttg gttgcgactc cttatcaacc tcctcaaaag 180  
tga 183

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Ile Ser Phe Gly Leu Ala Asn Ala Tyr Leu Pro Leu Ala Gln Leu Leu  
1 5 10 15

Tyr His Phe Asp Trp Lys Leu Pro Ala Gly Ile Glu Pro Ser Asp Leu  
20 25 30

Asp Leu Thr Glu Leu Val Gly Val Thr Ala Ala Arg Lys Ser Asp Leu  
35 40 45

Tyr Leu Val Ala Thr Pro Tyr Gln Pro Pro Gln Lys  
50 55 60

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cagtctatat catctatatg tactcaataa ttgtatggga 220

<210> 36  
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<400> 36

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1 5 10 15

Tyr His Phe Asp Trp Lys Leu Pro Asn Gly Gln Ser His Glu Asn Phe  
20 25 30

Asp Met Thr Glu Ser Pro Gly Ile Ser Ala Thr Arg Lys Asp Asp Leu  
35 40 45

Val Leu Ile Ala Thr Pro Tyr Asp Ser Tyr

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55

<210> 37  
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<210> 38  
 <211> 57  
 <212> PRT  
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<400> 38

Met Leu Phe Gly Leu Ala Asn Val Gly Gln Pro Leu Ala Gln Leu Leu  
 1 5 10 15

Tyr His Phe Asp Trp Lys Leu Pro Asn Gly Gln Thr His Gln Asn Phe  
 20 25 30

Asp Met Thr Glu Ser Pro Gly Ile Ser Ala Thr Arg Lys Asp Asp Leu  
 35 40 45

Ile Leu Ile Ala Thr Pro Ala His Ser  
 50 55

<210> 39  
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 <212> PRT  
 <213> NICOTIANATABACUM

<400> 40

Leu Leu Phe Gly Leu Val Asn Val Gly His Pro Leu Ala Gln Leu Leu  
 1 5 10 15



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Tyr His Phe Asp Trp Lys Thr Leu Pro Gly Ile Ser Ser Asp Ser Phe  
 20 25 30

Asp Met Thr Glu Thr Asp Gly Val Thr Ala Gly Arg Lys Asp Asp Leu  
 35 40 45

Cys Leu Ile Ala Thr Pro Phe Gly Leu Asn  
 50 55

<210> 41  
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 tttgcagcaa gcaaagatga cctctacttg attccaacaa atcacatgga gcaagagtag 180

<210> 42  
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 <213> NICOTIANATABACUM

<400> 42

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 1 5 10 15

Tyr Phe Phe Asp Trp Lys Phe Pro His Lys Val Asn Ala Ala Asp Phe  
 20 25 30

His Thr Thr Glu Thr Ser Arg Val Phe Ala Ala Ser Lys Asp Asp Leu  
 35 40 45

Tyr Leu Ile Pro Thr Asn His Met Glu Gln Glu  
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<210> 43  
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<210> 44  
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<212> PRT  
<213> NICOTIANATABACUM

<400> 44

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1 5 10 15

Tyr Cys Phe Asp Trp Lys Leu Pro Asp Lys Val Asn Ala Asn Asp Phe  
20 25 30

Arg Thr Thr Glu Thr Ser Arg Val Phe Ala Ala Ser Lys Asp Asp Leu  
35 40 45

Tyr Leu Ile Pro Thr Asn His Arg Glu Gln Glu  
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<210> 45  
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<212> DNA  
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<400> 45

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taa	183

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1 5 10 15

His Asn Phe Asp Trp Lys Leu Pro Glu Gly Ile Asn Ala Arg Asp Leu  
20 25 30

Asp Met Thr Glu Ala Asn Gly Ile Ser Ala Arg Arg Glu Lys Asp Leu  
35 40 45

Tyr Leu Ile Ala Thr Pro Tyr Val Ser Pro Leu Asp  
50 55 60

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79601-7270 Sequence Listing v2 -03-25-04.ST25

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 Met Thr Tyr Ala Leu Gln Val Glu His Leu Thr Met Ala His Leu Ile  
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 Gln Gly Phe Asn Tyr Arg Thr Pro Thr Asp Glu Pro Leu Asp Met Lys  
 20 25 30  
 Glu Gly Ala Gly Ile Thr Ile Arg Lys Val Asn Pro Val Lys Val Ile  
 35 40 45  
 Ile Thr Pro Arg Leu Ala Pro Glu Leu Tyr  
 50 55

<210> 49  
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<400> 50  
 Met Thr Tyr Ala Leu Gln Val Glu His Leu Thr Met Ala His Leu Ile  
 1 5 10 15  
 Gln Gly Phe Asn Tyr Lys Thr Pro Asn Asp Glu Ala Leu Asp Met Lys  
 20 25 30  
 Glu Gly Ala Gly Ile Thr Ile Arg Lys Val Asn Pro Val Glu Leu Ile  
 35 40 45

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Ile Ala Pro Arg Leu Ala Pro Glu Leu Tyr  
50 55

<210> 51  
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aaggtaaatc cagtggaatt gataataacg cctcgcttgg cacctgagct ttactaa 177

<210> 52  
<211> 58  
<212> PRT  
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<400> 52  
Met Thr Tyr Ala Leu Gln Val Glu His Leu Thr Met Ala His Leu Ile  
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Gln Gly Phe Asn Tyr Lys Thr Pro Asn Asp Glu Ala Leu Asp Met Lys  
20 25 30

Glu Gly Ala Gly Ile Thr Ile Arg Lys Val Asn Pro Val Glu Leu Ile  
35 40 45

Ile Thr Pro Arg Leu Ala Pro Glu Leu Tyr  
50 55

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<400> 54  
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79601-7270 Sequence Listing v2 -03-25-04.ST25

Gln Gly Phe Asn Tyr Arg Thr Pro Asn Asp Glu Pro Leu Asp Met Lys  
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Glu Gly Ala Gly Ile Thr Ile Arg Lys Val Asn Pro Val Glu Leu Ile  
35 40 45

Ile Ala Pro Arg Leu Ala Pro Glu Leu Tyr  
50 55

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<210> 56  
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<212> PRT  
<213> NICOTIANATABACUM

<400> 56  
Met Thr Tyr Ala Leu Gln Val Glu His Leu Thr Met Ala His Leu Ile  
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Gln Gly Phe Asn Tyr Arg Thr Pro Asn Asp Glu Pro Leu Asp Met Lys  
20 25 30

Glu Gly Ala Gly Ile Thr Ile Arg Lys Val Asn Pro Val Glu Leu Ile  
35 40 45

Ile Ala Pro Leu Ala Pro Glu Leu Tyr  
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79601-7270 Sequence Listing v2 -03-25-04.ST25

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Gln Gly Phe Asn Tyr Arg Thr Pro Asn Asp Glu Pro Leu Asp Met Lys  
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Glu Gly Ala Gly Ile Thr Ile Arg Lys Val Asn Pro Ala Glu Leu Ile  
 35 40 45

Ile Ala Pro Arg Leu Ala Pro Glu Leu Tyr  
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<400> 60

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Gln Gly Phe Asn Tyr Lys Thr Pro Asn Asp Glu Pro Leu Asp Met Lys  
 20 25 30

Glu Gly Ala Gly Leu Thr Ile Arg Lys Val Asn Pro Val Glu Val Thr  
 35 40 45

Thr Thr Ala Arg Leu Ala Pro Glu Leu Tyr  
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79601-7270 Sequence Listing v2 -03-25-04.ST25

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<210> 62  
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<400> 62  
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Gln Gly Phe Asn Tyr Lys Thr Pro Asn Asp Glu Pro Leu Asp Met Lys  
20 25 30

Glu Gly Ala Gly Leu Thr Ile Arg Lys Val Asn Pro Val Glu Val Thr  
35 40 45

Ile Thr Ala Arg Leu Ala Pro Glu Leu Tyr  
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<210> 63  
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aaagtaaadc ctgtagaagt gacaattacg gctcgcctgg cacctgagct ttattaa 177

<210> 64  
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1 5 10 15

Gln Gly Phe Asn Tyr Lys Thr Pro Asn Asp Glu Pro Leu Asp Met Lys  
20 25 30

Glu Gly Ala Gly Leu Thr Ile Arg Lys Val Asn Pro Val Glu Val Thr  
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## 79601-7270 Sequence Listing v2 -03-25-04.ST25

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 tattccccca tcacttaa 198

<210> 66  
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<400> 66  
 Tyr Ser Leu Gly Leu Lys Val Ile Arg Val Thr Leu Ala Asn Met Leu  
 1 5 10 15

His Gly Phe Asn Trp Lys Leu Pro Glu Gly Met Lys Pro Glu Asp Ile  
 20 25 30

Ser Val Glu Glu His Tyr Gly Leu Thr Thr His Pro Lys Phe Pro Val  
 35 40 45

Pro Val Ile Leu Glu Ser Arg Leu Ser Ser Asp Leu Tyr Ser Pro Ile  
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Thr  
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<210> 67  
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 <212> DNA  
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 aattacacac cccaaagtcg cacttgacgt gatgatggag cctcgacttc ccaaccatct 180  
 ttacaaatag 190

<210> 68



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<211> 62  
<212> PRT  
<213> NICOTIANATABACUM

<400> 68

Tyr Ser Leu Gly Ile Arg Ile Ile Arg Ala Thr Leu Ala Asn Leu Leu  
1 5 10 15

His Gly Phe Asn Trp Arg Leu Pro Asn Gly Met Ser Pro Glu Asp Ile  
20 25 30

Ser Met Glu Glu Ile Tyr Gly Leu Ile Thr His Pro Lys Val Ala Leu  
35 40 45

Asp Val Met Met Glu Pro Arg Leu Pro Asn His Leu Tyr Lys  
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<210> 69  
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<212> DNA  
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<400> 69

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<210> 70  
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<400> 70

Ile Asn Phe Ser Ile Pro Leu Val Glu Leu Ala Leu Ala Asn Leu Leu  
1 5 10 15

Phe His Tyr Asn Trp Ser Leu Pro Glu Gly Met Leu Ala Lys Asp Val  
20 25 30

Asp Met Glu Glu Ala Leu Gly Ile Thr Met His Lys Lys Ser Pro Leu  
35 40 45

Cys Leu Val Ala Ser His Tyr Thr Cys  
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<210> 71  
<211> 190  
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79601-7270 Sequence Listing v2 -03-25-04.ST25

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actgctccaa aagctaatacg actcgtggct gtgcctactc cacgtttggt gtgtcccctt 180  
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His Cys Phe Thr Trp Glu Leu Pro Asp Gly Met Lys Pro Ser Glu Leu  
20 25 30  
Lys Met Asp Asp Ile Phe Gly Leu Thr Ala Pro Lys Ala Asn Arg Leu  
35 40 45  
Val Ala Val Pro Thr Pro Arg Leu Leu Cys Pro Leu Tyr  
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<210> 73  
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actgctccaa gagctaatacg actcgtggct gtgcctagtc cacgtttggt gtgcccactt 180  
tattaa 186

<210> 74  
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<213> NICOTIANATABACUM

<400> 74  
Met Gln Leu Gly Leu Tyr Ala Leu Glu Met Ala Val Ala His Leu Leu  
1 5 10 15  
Leu Cys Phe Thr Trp Glu Leu Pro Asp Gly Met Lys Pro Ser Glu Leu  
20 25 30

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Lys Met Asp Asp Ile Phe Gly Leu Thr Ala Pro Arg Ala Asn Arg Leu  
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Val Ala Val Pro Ser Pro Arg Leu Leu Cys Pro Leu Tyr  
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actgctccaa gagctaatacg actcgtggct gtgcctactc cacgtttgtt gtgtccccctt 180  
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<213> NICOTIANATABACUM

<400> 76

Met Gln Leu Gly Leu Tyr Ala Leu Glu Met Ala Val Ala His Leu Leu  
1 5 10 15

His Cys Phe Thr Trp Glu Leu Pro Asp Gly Met Lys Pro Ser Glu Leu  
20 25 30

Lys Met Asp Asp Ile Phe Gly Leu Thr Ala Pro Arg Ala Asn Arg Leu  
35 40 45

Val Ala Val Pro Thr Pro Arg Leu Leu Cys Pro Leu Tyr  
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<400> 78

79601-7270 Sequence Listing v2 -03-25-04.ST25

Met Leu Trp Ser Ala Ser Ile Val Arg Val Ser Tyr Leu Thr Cys Ile  
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Tyr Arg Phe Gln Val Tyr Ala Gly Ser Val Phe Arg Val Ala  
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<210> 79  
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<400> 81  
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gtatatgctg ggtctgtggtt cagagtagca tga 93

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Tyr Arg Phe Gln Val Tyr Ala Gly Ser Val Phe Arg Val Ala  
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<210> 83  
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79601-7270 Sequence Listing v2 -03-25-04.ST25

<212> DNA  
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accatgcaca agaaatctcc cctttgctta gtagcttctc attataactt gttgtga 177

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<212> PRT  
<213> NICOTIANATABACUM

<400> 84  
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1 5 10 15  
Phe His Tyr Asn Trp Ser Leu Pro Glu Gly Met Leu Pro Lys Asp Val  
20 25 30  
Asp Met Glu Glu Ala Leu Gly Ile Thr Met His Lys Lys Ser Pro Leu  
35 40 45  
Cys Leu Val Ala Ser His Tyr Asn Leu Leu  
50 55

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<212> DNA  
<213> NICOTIANATABACUM

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Leu Tyr His Phe Asp Trp Lys Leu Pro Thr Gly Ile Asn Ser Ser Asp  
20 25 30

79601-7270 Sequence Listing v2 -03-25-04.ST25

Leu Asp Met Thr Glu Ser Ser Gly Val Thr Cys Ala Arg Lys Ser Asp  
 35 40 45

Leu Tyr Leu Thr Ala Thr Pro Tyr Gln Leu Ser Gln Glu  
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<210> 87  
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 <212> DNA  
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 <213> NICOTIANATABACUM

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 <211> 153  
 <212> DNA  
 <213> NICOTIANATABACUM

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 catgggtgctc ctttgatttt gcgcaagctg tag 153

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 <212> PRT  
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<400> 90  
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 1 5 10 15

Gln His Tyr Ala Phe Glu Leu Ser Pro Ser Tyr Ala His Ala Pro His  
 20 25 30

## 79601-7270 Sequence Listing v2 -03-25-04.ST25

Thr Ile Ile Thr Leu Gln Pro Gln His Gly Ala Pro Leu Ile Leu Arg  
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Lys Leu  
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 catgggtgctc ctttgatttt gcgcaagctg tag 153

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<400> 92

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 1 5 10 15

Gln His Tyr Ala Phe Glu Leu Ser Pro Ser Tyr Ala His Ala Pro His  
 20 25 30

Thr Ile Ile Thr Leu Gln Pro Gln His Gly Ala Pro Leu Ile Leu Arg  
 35 40 45

Lys Leu  
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 <212> DNA  
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 tgtgggtgctc acttaatcct gcaaaaatta taggtcctta atctggattt cccattattg 180  
 agtagtgcct aataaatcct ctctatcact atttttccat ctttca 226

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 <212> PRT  
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79601-7270 Sequence Listing v2 -03-25-04.ST25

<400> 94

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1 5 10 15

Gln Arg Phe Ala Phe Glu Leu Ser Pro Ser Tyr Ala His Ala Pro Thr  
20 25 30

Tyr Val Val Thr Leu Arg Pro Gln Cys Gly Ala His Leu Ile Leu Gln  
35 40 45

Lys Leu  
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<210> 95

<211> 268

<212> DNA

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attctacaac gcttctcctt cgagctctcc ccattctata cacactctcc atacactgtg	180
gtcactttga aacccaaata tgggtgctccc ctaataatgc acaggctgta gtcctgtgag	240
aatatgctat ccgaggaatt cagttcct	268

<210> 96

<211> 50

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<213> NICOTIANATABACUM

<400> 96

Gln Asn Phe Ala Ile Leu Glu Ala Lys Met Ala Ile Ala Met Ile Leu  
1 5 10 15

Gln Arg Phe Ser Phe Glu Leu Ser Pro Ser Tyr Thr His Ser Pro Tyr  
20 25 30

Thr Val Val Thr Leu Lys Pro Lys Tyr Gly Ala Pro Leu Ile Met His  
35 40 45

Arg Leu  
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attctacaac gcttctcctt cgagctctct ccatcttata cacactctcc atacactgtg 180  
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<210> 98  
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<212> PRT  
<213> NICOTIANATABACUM

<400> 98  
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1 5 10 15  
Gln Arg Phe Ser Phe Glu Leu Ser Pro Ser Tyr Thr His Ser Pro Tyr  
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Thr Val Val Thr Leu Lys Pro Lys Tyr Gly Ala Pro Leu Ile Met His  
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Arg Leu  
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<212> DNA  
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tttgaactgt ctccgtctta tgcacatgcc cctcagtcca tattaaccgt cagccacaat 120  
atgggtgctcc acttattttc cacaagctat aa 152

<210> 100  
<211> 50  
<212> PRT  
<213> NICOTIANATABACUM

<400> 100  
Gln Asn Phe Ala Met Leu Glu Ala Lys Met Ala Leu Ser Met Ile Leu  
1 5 10 15  
Gln Arg Phe Ser Phe Glu Leu Ser Pro Ser Tyr Ala His Ala Pro Gln  
20 25 30

Ser Ile Leu Thr Val Gln Pro Gln Tyr Gly Ala Pro Leu Ile Phe His  
Page 29

35

40

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Lys Leu  
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<210> 101  
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<212> DNA  
<213> NICOTIANATABACUM

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tatggtgctc ctcttatatt gcacaaattg taa 153

<210> 102  
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<212> PRT  
<213> NICOTIANATABACUM

<400> 102

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Gln Arg Phe Ser Phe Glu Leu Ser Pro Ser Tyr Thr His Ala Pro Gln  
20 25 30

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35 40 45

Lys Leu  
50

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tatggtgctc ctcttatatt gcacaaattg taa 153

<210> 104  
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<400> 104

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Ile Asn Phe Ala Met Ala Glu Ala Lys Met Ala Met Ala Met Ile Leu  
 1 5 10 15

Gln Arg Phe Ser Phe Glu Leu Ser Pro Ser Tyr Thr His Ala Pro Gln  
 20 25 30

Ser Val Ile Thr Met Gln Pro Gln Tyr Gly Ala Pro Leu Ile Leu His  
 35 40 45

Lys Leu  
 50

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 <212> DNA  
 <213> NICOTIANATABACUM

<400> 105  
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 tatggtgctc ctctgcttat gcgcagactt taa 153

<210> 106  
 <211> 50  
 <212> PRT  
 <213> NICOTIANATABACUM

<400> 106

Gln Asn Phe Ala Met Met Glu Ala Lys Met Ala Val Ala Met Ile Leu  
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Gln Lys Phe Ser Phe Glu Leu Ser Pro Ser Tyr Thr His Ala Pro Phe  
 20 25 30

Ala Ile Val Thr Ile His Pro Gln Tyr Gly Ala Pro Leu Leu Met Arg  
 35 40 45

Arg Leu  
 50

<210> 107  
 <211> 153  
 <212> DNA  
 <213> NICOTIANATABACUM

<400> 107  
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 tttgaactat ccccttctta tacacatgct ccatttgcaa ttgtgactat tcatcctcag 120  
 tatggtgctc ctctgcttat gcgcagactt taa 153

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<210> 108  
 <211> 49  
 <212> PRT  
 <213> NICOTIANATABACUM

<400> 108

Gln Asn Phe Ala Met Met Glu Ala Lys Met Ala Val Ala Met Ile Leu  
 1 5 10 15

His Lys Phe Ser Phe Glu Leu Pro Ser Tyr Thr His Ala Pro Phe Ala  
 20 25 30

Ile Val Thr Ile His Pro Gln Tyr Gly Ala Pro Leu Leu Met Arg Arg  
 35 40 45

Leu

<210> 109  
 <211> 150  
 <212> DNA  
 <213> NICOTIANATABACUM

<400> 109  
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 tttgaactct ctccatctta tgctcatgct cctcatccac tactacttca acctcaatat 120  
 ggtgctcaat taattttgta caagttgtag 150

<210> 110  
 <211> 49  
 <212> PRT  
 <213> NICOTIANATABACUM

<400> 110

Gln Asn Phe Ala Met Leu Glu Ala Lys Met Ala Met Ala Met Ile Leu  
 1 5 10 15

Lys Thr Tyr Ala Phe Glu Leu Ser Pro Ser Tyr Ala His Ala Pro His  
 20 25 30

Pro Leu Leu Leu Gln Pro Gln Tyr Gly Ala Gln Leu Ile Leu Tyr Lys  
 35 40 45

Leu

<210> 111  
 <211> 192

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<212> DNA  
<213> NICOTIANATABACUM

<400> 111  
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tggtcattgc ctgataatat gactcctgag gacctcaaca tggatgagat ttttgggctc 120  
tctacaccta aaaaatttcc acttgctact gtgattgagc caagactttc accaaaactt 180  
tactctgttt ga 192

<210> 112  
<211> 63  
<212> PRT  
<213> NICOTIANATABACUM

<400> 112  
Tyr Ser Met Gly Leu Lys Ala Ile Gln Ala Ser Leu Ala Asn Leu Leu  
1 5 10 15  
His Gly Phe Asn Trp Ser Leu Pro Asp Asn Met Thr Pro Glu Asp Leu  
20 25 30  
Asn Met Asp Glu Ile Phe Gly Leu Ser Thr Pro Lys Lys Phe Pro Leu  
35 40 45  
Ala Thr Val Ile Glu Pro Arg Leu Ser Pro Lys Leu Tyr Ser Val  
50 55 60

<210> 113  
<211> 192  
<212> DNA  
<213> NICOTIANATABACUM

<400> 113  
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tggtcattgc ctgataatat gactcctgag gacctcaaca tggatgagat ttttgggctc 120  
tctacaccta aaaaatttcc acttgctact gtgattgagc caagactttc accaaaactt 180  
tactctgttt ga 192

<210> 114  
<211> 63  
<212> PRT  
<213> NICOTIANATABACUM

<400> 114  
Tyr Ser Leu Gly Leu Lys Glu Ile Gln Ala Ser Leu Ala Asn Leu Leu  
1 5 10 15  
His Gly Phe Asn Trp Ser Leu Pro Asp Asn Met Thr Pro Glu Asp Leu  
Page 33

Asn Met Asp Glu Ile Phe Gly Leu Ser Thr Pro Lys Lys Phe Pro Leu  
35 40 45

Ala Thr Val Ile Glu Pro Arg Leu Ser Pro Lys Leu Tyr Ser Val  
50 55 60

<210> 115  
<211> 192  
<212> DNA  
<213> NICOTIANATABACUM

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tggtcattgc ctgataatat gactcctgag gacctcaaca tggatgagat ttttgggctc 120  
tctacaccta aaaaatttcc acttgctact gtgattgagc caagactttc accaaaactt 180  
tactctgttt ga 192

<210> 116  
<211> 63  
<212> PRT  
<213> NICOTIANATABACUM

<400> 116  
His Ser Leu Gly Leu Lys Val Ile Gln Ala Ser Leu Ala Asn Leu Leu  
1 5 10 15

His Gly Phe Asn Trp Ser Leu Pro Asp Asn Met Thr Pro Glu Asp Leu  
20 25 30

Asn Met Asp Glu Ile Phe Gly Leu Ser Thr Pro Lys Lys Phe Pro Leu  
35 40 45

Ala Thr Val Ile Glu Pro Arg Leu Ser Pro Lys Leu Tyr Ser Val  
50 55 60

<210> 117  
<211> 96  
<212> DNA  
<213> NICOTIANATABACUM

<400> 117  
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aatttcttgc aaatttctcc ttccatttct tatta 96

<210> 118  
<211> 31  
<212> PRT

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<213> NICOTIANATABACUM

<400> 118

Leu Cys Phe Pro Cys Leu Ile Ser Ser Tyr Ile Leu Ala Leu Asn Val  
1 5 10 15

Asn Leu Tyr His Asn Phe Leu Gln Ile Ser Pro Ser Ile Ser Tyr  
20 25 30

<210> 119

<211> 192

<212> DNA

<213> NICOTIANATABACUM

<400> 119

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tggaaaaggg taagcgaaga ggtggttgat ttgacggaag gaaaaggtct cactatgccca 120  
aaacccgagc cactcatggc taggtgcgaa gctcgtgaca tttttcacaa agttctttca 180  
gaaatatctt aa 192

<210> 120

<211> 63

<212> PRT

<213> NICOTIANATABACUM

<400> 120

Ser Gly Leu Ala Gln Cys Val Val Gly Leu Ala Leu Ala Thr Leu Val  
1 5 10 15

Gln Cys Phe Glu Trp Lys Arg Val Ser Glu Glu Val Val Asp Leu Thr  
20 25 30

Glu Gly Lys Gly Leu Thr Met Pro Lys Pro Glu Pro Leu Met Ala Arg  
35 40 45

Cys Glu Ala Arg Asp Ile Phe His Lys Val Leu Ser Glu Ile Ser  
50 55 60

<210> 121

<211> 174

<212> DNA

<213> NICOTIANATABACUM

<400> 121

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tgggccgctt acccggaata taggaaagtg gattttactg agaaattgga atttactgtg 120  
gtgatgaaaa atcctttaag agctaaggct aagccaagaa tgcaagtggg gtaa 174

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<210> 122  
 <211> 57  
 <212> PRT  
 <213> NICOTIANATABACUM

<400> 122

Leu Gly Leu Ala Thr Val His Val Asn Leu Met Leu Ala Arg Met Ile  
 1 5 10 15

Gln Glu Phe Glu Trp Ser Ala Tyr Pro Glu Asn Arg Lys Val Asp Phe  
 20 25 30

Thr Glu Lys Leu Glu Phe Thr Val Val Met Lys Asn Pro Leu Arg Ala  
 35 40 45

Lys Val Lys Pro Arg Met Gln Val Val  
 50 55

<210> 123  
 <211> 171  
 <212> DNA  
 <213> NICOTIANATABACUM

<400> 123

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 atgaagaatc cacttcgagc tcgtatctgc cccagagtta actctatttg a 171

<210> 124  
 <211> 56  
 <212> PRT  
 <213> NICOTIANATABACUM

<400> 124

Tyr Ala Leu Ala Met Leu His Leu Glu Tyr Phe Val Ala Asn Leu Val  
 1 5 10 15

Trp His Phe Arg Trp Glu Ala Val Glu Gly Asp Asp Val Asp Leu Ser  
 20 25 30

Glu Lys Leu Glu Phe Thr Val Val Met Lys Asn Pro Leu Arg Ala Arg  
 35 40 45

Ile Cys Pro Arg Val Asn Ser Ile  
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<210> 125  
 <211> 186  
 <212> DNA  
 <213> NICOTIANATABACUM



79601-7270 Sequence Listing v2 -03-25-04.ST25

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 aagctgaaac ctcgctcaca ccagaaacaa gttgaactca ccgatttaaa tccagcaagt 120  
 tggcttcatt cgataaaaagg cgaactgtta gtcgatgcga ttcctcgaaa gaaggcggca 180  
 ttttaa 186

<210> 126  
 <211> 61  
 <212> PRT  
 <213> NICOTIANATABACUM

<400> 126  
 Gly Gln Gln Val Gly Leu Leu Arg Thr Thr Ile Phe Ile Ala Ser Leu  
 1 5 10 15  
 Leu Ser Glu Tyr Lys Leu Lys Pro Arg Ser His Gln Lys Gln Val Glu  
 20 25 30  
 Leu Thr Asp Leu Asn Pro Ala Ser Trp Leu His Ser Ile Lys Gly Glu  
 35 40 45  
 Leu Leu Val Asp Ala Ile Pro Arg Lys Lys Ala Ala Phe  
 50 55 60

<210> 127  
 <211> 171  
 <212> DNA  
 <213> NICOTIANATABACUM

<400> 127  
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 ttctcgctac caaaaggagt taagcatgag gatttggacg tggaggaagc tgctggaatt 120  
 actgttagaa ggaagttccc ccttttagcc gtcgccactc catgctcgtg a 171

<210> ~ 128  
 <211> 56  
 <212> PRT  
 <213> NICOTIANATABACUM

<400> 128  
 Ile Thr Phe Ala Lys Phe Val Asn Glu Leu Ala Leu Ala Arg Leu Met  
 1 5 10 15  
 Phe His Phe Asp Phe Ser Leu Pro Lys Gly Val Lys His Glu Asp Leu  
 20 25 30  
 Asp Val Glu Glu Ala Ala Gly Ile Thr Val Arg Arg Lys Phe Pro Leu  
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35

40

45

Leu Ala Val Ala Thr Pro Cys Ser  
50 55

<210> 129  
<211> 180  
<212> DNA  
<213> NICOTIANATABACUM

<400> 129  
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ttcaagaggc acaaaacgga cggctgtgat gatatcgctg atattccaac cattgctcca 120  
aaggatgatt gtaaagtgtt cctttcacag aggtgcactc gattcccatc tttttcatga 180

<210> 130  
<211> 59  
<212> PRT  
<213> NICOTIANATABACUM

<400> 130  
Gln Arg Tyr Ala Ile Asn His Leu Met Leu Phe Ile Ala Leu Phe Thr  
1 5 10 15

Ala Leu Ile Asp Phe Lys Arg His Lys Thr Asp Gly Cys Asp Asp Ile  
20 25 30

Ala Tyr Ile Pro Thr Ile Ala Pro Lys Asp Asp Cys Lys Val Phe Leu  
35 40 45

Ser Gln Arg Cys Thr Arg Phe Pro Ser Phe Ser  
50 55

<210> 131  
<211> 183  
<212> DNA  
<213> NICOTIANATABACUM

<400> 131  
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tggaactcc caaccggaat caagccaaga gacttggact tgaccgaatt atcggaata 120  
actattgcta gaaagggatga cctttactta aatgctactc cttatcaacc ttctcgagag 180  
taa 183

<210> 132  
<211> 60  
<212> PRT  
<213> NICOTIANATABACUM

79601-7270 Sequence Listing v2 -03-25-04.ST25

<400> 132

Met Ser Phe Gly Leu Ala Asn Leu Tyr Leu Pro Leu Ala Gln Leu Leu  
1 5 10 15

Tyr His Phe Asp Trp Lys Leu Pro Thr Gly Ile Lys Pro Arg Asp Leu  
20 25 30

Asp Leu Thr Glu Leu Ser Gly Ile Thr Ile Ala Arg Lys Gly Asp Leu  
35 40 45

Tyr Leu Asn Ala Thr Pro Tyr Gln Pro Ser Arg Glu  
50 55 60

<210> 133

<211> 174

<212> DNA

<213> NICOTIANATABACUM

<400> 133

ttgggcttgg caacggtgca tgtgaatttg atgttggtccc gaacgattca agaatttgaa 60

tggtccgctt acccggaata taggaaagtg gattttactg agaaattgga atttactgtg 120

gtgatgaaaa accctttaag agctaaggtc aagccaagaa tgcaagtggg gtaa 174

<210> 134

<211> 57

<212> PRT

<213> NICOTIANATABACUM

<400> 134

Leu Gly Leu Ala Thr Val His Val Asn Leu Met Leu Ala Arg Thr Ile  
1 5 10 15

Gln Glu Phe Glu Trp Ser Ala Tyr Pro Glu Asn Arg Lys Val Asp Phe  
20 25 30

Thr Glu Lys Leu Glu Phe Thr Val Val Met Lys Asn Pro Leu Arg Ala  
35 40 45

Lys Val Lys Pro Arg Met Gln Val Val  
50 55

<210> 135

<211> 123

<212> DNA

<213> NICOTIANATABACUM

<400> 135

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tggtccgctt acccggaata taggaaagtg gattttactga gaaattggaa tttactgtgg 120

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tga

123

<210> 136  
 <211> 40  
 <212> PRT  
 <213> NICOTIANATABACUM

&lt;400&gt; 136

Leu Gly Leu Ala Thr Val His Val Asn Leu Met Leu Ala Arg Met Ile  
 1 5 10 15

Gln Glu Phe Glu Trp Ser Ala Tyr Pro Glu Asn Arg Lys Val Asp Leu  
 20 25 30

Leu Arg Asn Trp Asn Leu Leu Trp  
 35 40

<210> 137  
 <211> 171  
 <212> DNA  
 <213> NICOTIANATABACUM

<400> 137  
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 actgttagga ggaagttccc ccttttagcc gtcgccactc catgctcgtg a 171

<210> 138  
 <211> 56  
 <212> PRT  
 <213> NICOTIANATABACUM

&lt;400&gt; 138

Ile Thr Phe Ala Lys Phe Val Asn Glu Leu Ala Leu Ala Arg Leu Met  
 1 5 10 15

Phe His Phe Asp Phe Ser Leu Pro Lys Gly Val Lys His Glu Asp Leu  
 20 25 30

Asp Val Glu Glu Ala Ala Gly Ile Thr Val Arg Arg Lys Phe Pro Leu  
 35 40 45

Leu Ala Val Ala Thr Pro Cys Ser  
 50 55

<210> 139  
 <211> 171  
 <212> DNA  
 <213> NICOTIANATABACUM

79601-7270 Sequence Listing v2 -03-25-04.ST25

<400> 139  
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 actgttagaa ggaagttccc ccttttagcc gtcgccactc catgctcgtg a 171

<210> 140  
 <211> 56  
 <212> PRT  
 <213> NICOTIANATABACUM

<400> 140

Ile Thr Phe Ala Lys Phe Val Asn Glu Leu Ala Leu Ala Arg Leu Met  
 1 5 10 15

Phe His Phe Asp Phe Ser Leu Pro Lys Gly Val Lys His Ala Asp Leu  
 20 25 30

Asp Val Glu Glu Ala Ala Gly Ile Thr Val Arg Arg Lys Phe Pro Leu  
 35 40 45

Leu Ala Val Ala Thr Pro Cys Ser  
 50 55

<210> 141  
 <211> 153  
 <212> DNA  
 <213> NICOTIANATABACUM

<400> 141  
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 tatggtgctc cacttatittt gcataaaata tag 153

<210> 142  
 <211> 50  
 <212> PRT  
 <213> NICOTIANATABACUM

<400> 142

Gln Asn Phe Ala Met Leu Glu Ala Lys Thr Thr Leu Ala Met Ile Leu  
 1 5 10 15

Gln Arg Phe Ser Phe Glu Leu Ser Pro Ser Tyr Ala His Ala Pro Gln  
 20 25 30

Ser Ile Ile Thr Leu Gln Pro Gln Tyr Gly Ala Pro Leu Ile Leu His  
 35 40 45

79601-7270 Sequence Listing v2 -03-25-04.ST25

Lys Ile  
50

<210> 143  
<211> 171  
<212> DNA  
<213> NICOTIANATABACUM

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ctgcacattt tgaagcattc caccattgtg atgaaaccaa gatcttttta a 171

<210> 144  
<211> 56  
<212> PRT  
<213> NICOTIANATABACUM

<400> 144

Ile Ile Leu Ala Leu Pro Ile Leu Gly Ile Thr Leu Gly Arg Leu Val  
1 5 10 15

Gln Asn Phe Glu Leu Leu Pro Pro Pro Gly Gln Ser Lys Leu Asp Thr  
20 25 30

Thr Glu Lys Gly Gly Gln Phe Ser Leu His Ile Leu Lys His Ser Thr  
35 40 45

Ile Val Met Lys Pro Arg Ser Phe  
50 55

<210> 145  
<211> 267  
<212> DNA  
<213> NICOTIANATABACUM

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atggtgctcc acttattttg cataaaatat agtttattac ttgtaagtag tgtctcgttt 180  
tatgttaagc atgagtccaa aatgttaagg cttgtagaac tgcaaaatgg gaatgcattt 240  
gcactcgtgc actgtagatt gttgtaa 267

<210> 146  
<211> 88  
<212> PRT  
<213> NICOTIANATABACUM

79601-7270 Sequence Listing v2 -03-25-04.ST25

<400> 146

Gln Asn Phe Ala Met Leu Glu Ala Lys Thr Thr Leu Ala Met Ile Leu  
1 5 10 15

Gln Arg Phe Ser Phe Glu Leu Ser Pro Ser Tyr Ala His Ala Pro Gln  
20 25 30

Ser Ile Ile Thr Cys Asn Pro Ser Met Val Leu His Leu Phe Cys Ile  
35 40 45

Lys Tyr Ser Leu Leu Leu Val Ser Ser Val Ser Phe Tyr Val Lys His  
50 55 60

Glu Ser Lys Met Leu Arg Leu Val Glu Leu Gln Asn Gly Asn Ala Phe  
65 70 75 80

Ala Leu Val His Cys Arg Leu Leu  
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<210> 147

<211> 186

<212> DNA

<213> NICOTIANATABACUM

<400> 147

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tggcaaattg aggaagcgga aagcttggag gaaagctata attctagaat gactatgcag 120  
aacaagcctt tgaaggttgt ctgcactcca cgcgaagatc ttggccagct tctatcccaa 180  
ctctaa 186

<210> 148

<211> 61

<212> PRT

<213> NICOTIANATABACUM

<400> 148

Ala Asp Met Gly Leu Arg Ala Val Ser Leu Ala Leu Gly Ala Leu Ile  
1 5 10 15

Gln Cys Phe Asp Trp Gln Ile Glu Glu Ala Glu Ser Leu Glu Glu Ser  
20 25 30

Tyr Asn Ser Arg Met Thr Met Gln Asn Lys Pro Leu Lys Val Val Cys  
35 40 45

Thr Pro Arg Glu Asp Leu Gly Gln Leu Leu Ser Gln Leu  
50 55 60

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<210> 149  
 <211> 1576  
 <212> DNA  
 <213> NICOTIANATABACUM

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gcctcctggg ccatggaaat taccttttat tggaagtta caccatttggt ctgtggcagg    180
tccacttcct caccatggcc taaaaaat    agccaaacgc tatggtcctc ttatgcattt    240
acaacttgga caaatccta cactcatcat atcatcacct caaatggcaa aagaagtact    300
aaaaactcac gacctcgctt ttgccactag accaaagctt gtcgcggccg acatcattca    360
ctacgacagc acggacatag cattttctcc gtacggtgaa tactggagac aaattcgtaa    420
aatgtgcata ttggaactct tgagtgccaa gatgggtcaaa ttttttagct cgattcgcca    480
agatgagctc tcgaagatgc tctcatctat acgaacgaca cccaatctta cagtcaatct    540
tactgacaaa attttttggg ttacgagttc ggtaacttgt agatcagctt tagggaagat    600
atgtggtgac caagacaaat tgatcatttt tatgagggaa ataatatcat tggcagggtg    660
athtagtatt gctgattttt tccctacatg gaaaatgatt catgatattg atggttcgaa    720
atctaaactg gtgaaagcac atcgtaagat tgatgaaatt ttgggaaatg ttgttgatga    780
gcacaaaaag aacagagcag atggcaagaa gggtaatggg gaatttggtg gtgaagattt    840
gattgatgta ttgttaagag ttagagaaag tggagaagtt caaatccta tcacaaatga    900
caatatcaaa tcaatattaa tcgacatgtt ctctgcagga tctgaaacat catcgacgac    960
tataatttgg gcattagctg aaatgatgaa gaaaccaagt gtttttagcaa aggcacaaag    1020
tgaagtaagg caagcttga aggagaaaaa aggttttcaa cagattgatc ttgatgagct    1080
aaaatatctc aagttagtaa tcaaagaaac cttaagaatg caccctcaa ttcctctatt    1140
agttcctaga gaatgtatgg aggatacaaa gattgatggg tacaatatac ctttcaaaac    1200
aagagtcata gttaatgcat gggcaatcgg acgagatcca gaaagtggg atgaccccga    1260
aagctttatg ccagagagat ttgagaatag ttctattgac tttcttgga atcatcatca    1320
gtttatacca tttggtgcag gaagaaggat ttgtccggga atgctatttg gtttagctaa    1380
tgttggacaa ctttagctc agttacttta tcacttcgat tggaaactcc ctaatggaca    1440
aagtcatgag aatttcgaca tgactgagtc acctggaatt tctgctacaa gaaaggatga    1500
tcttgttttg attgccactc cttatgattc ttattaagca gtagcagaaa taaaagccg    1560
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<210> 150



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<211> 503  
<212> PRT  
<213> NICOTIANATABACUM

<400> 150

Met Glu Ile Gln Phe Ser Asn Leu Val Ala Phe Leu Leu Phe Leu Ser  
1 5 10 15

Ser Ile Phe Leu Leu Phe Lys Lys Trp Lys Thr Arg Lys Leu Asn Leu  
20 25 30

Pro Pro Gly Pro Trp Lys Leu Pro Phe Ile Gly Ser Leu His His Leu  
35 40 45

Ala Val Ala Gly Pro Leu Pro His His Gly Leu Lys Asn Leu Ala Lys  
50 55 60

Arg Tyr Gly Pro Leu Met His Leu Gln Leu Gly Gln Ile Pro Thr Leu  
65 70 75 80

Ile Ile Ser Ser Pro Gln Met Ala Lys Glu Val Leu Lys Thr His Asp  
85 90 95

Leu Ala Phe Ala Thr Arg Pro Lys Leu Val Ala Ala Asp Ile Ile His  
100 105 110

Tyr Asp Ser Thr Asp Ile Ala Phe Ser Pro Tyr Gly Glu Tyr Trp Arg  
115 120 125

Gln Ile Arg Lys Ile Cys Ile Leu Glu Leu Leu Ser Ala Lys Met Val  
130 135 140

Lys Phe Phe Ser Ser Ile Arg Gln Asp Glu Leu Ser Lys Met Leu Ser  
145 150 155 160

Ser Ile Arg Thr Thr Pro Asn Leu Thr Val Asn Leu Thr Asp Lys Ile  
165 170 175

Phe Trp Phe Thr Ser Ser Val Thr Cys Arg Ser Ala Leu Gly Lys Ile  
180 185 190

Cys Gly Asp Gln Asp Lys Leu Ile Ile Phe Met Arg Glu Ile Ile Ser  
195 200 205

Leu Ala Gly Gly Phe Ser Ile Ala Asp Phe Phe Pro Thr Trp Lys Met  
210 215 220

Ile His Asp Ile Asp Gly Ser Lys Ser Lys Leu Val Lys Ala His Arg  
Page 45

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225

230

235

240

Lys Ile Asp Glu Ile Leu Gly Asn Val Val Asp Glu His Lys Lys Asn  
 245 250 255

Arg Ala Asp Gly Lys Lys Gly Asn Gly Glu Phe Gly Gly Glu Asp Leu  
 260 265 270

Ile Asp Val Leu Leu Arg Val Arg Glu Ser Gly Glu Val Gln Ile Pro  
 275 280 285

Ile Thr Asn Asp Asn Ile Lys Ser Ile Leu Ile Asp Met Phe Ser Ala  
 290 295 300

Gly Ser Glu Thr Ser Ser Thr Thr Ile Ile Trp Ala Leu Ala Glu Met  
 305 310 315 320

Met Lys Lys Pro Ser Val Leu Ala Lys Ala Gln Ala Glu Val Arg Gln  
 325 330 335

Ala Leu Lys Glu Lys Lys Gly Phe Gln Gln Ile Asp Leu Asp Glu Leu  
 340 345 350

Lys Tyr Leu Lys Leu Val Ile Lys Glu Thr Leu Arg Met His Pro Pro  
 355 360 365

Ile Pro Leu Leu Val Pro Arg Glu Cys Met Glu Asp Thr Lys Ile Asp  
 370 375 380

Gly Tyr Asn Ile Pro Phe Lys Thr Arg Val Ile Val Asn Ala Trp Ala  
 385 390 395 400

Ile Gly Arg Asp Pro Glu Ser Trp Asp Asp Pro Glu Ser Phe Met Pro  
 405 410 415

Glu Arg Phe Glu Asn Ser Ser Ile Asp Phe Leu Gly Asn His His Gln  
 420 425 430

Phe Ile Pro Phe Gly Ala Gly Arg Arg Ile Cys Pro Gly Met Leu Phe  
 435 440 445

Gly Leu Ala Asn Val Gly Gln Pro Leu Ala Gln Leu Leu Tyr His Phe  
 450 455 460

Asp Trp Lys Leu Pro Asn Gly Gln Ser His Glu Asn Phe Asp Met Thr  
 465 470 475 480

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Glu Ser Pro Gly Ile Ser Ala Thr Arg Lys Asp Asp Leu Val Leu Ile  
 485 490 495

Ala Thr Pro Tyr Asp Ser Tyr  
 500

<210> 151  
 <211> 1581  
 <212> DNA  
 <213> NICOTIANATABACUM

<400> 151  
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 ttcttgctct ttctctccag catctttctt ctattcaaaa aatggaaaac cagaaaacta 120  
 aatttgcctc ctggtccatg gaaattacct ttatttgga gtttacacca ttgggctgtg 180  
 gcagggtccac ttcctcacca tggcctaaaa aatttagcca aacgctatgg tcctcttatg 240  
 catttacaac ttggacaaat tcctacactc atcatatcat cacctcaaat ggcaaaagaa 300  
 gtactaaaaa ctcacgacct cgcttttgcc actagaccaa agcttgtcgt ggccgacatc 360  
 attcactacg acagcacgga catagcattt tctccgtacg gtgaatactg gagacaaatt 420  
 cgtaaaattt gcatattgga actcttgagt gccaaagatgg tcaaattttt tagctcgatt 480  
 cgccaagatg agctctcgaa gatgctctca tctatacgaa cgacacccaa tcttacagtc 540  
 aatcttactg acaaaatttt ttggtttacg agttcggtaa cttgtagatc agctttaggg 600  
 aagatatgtg gtgaccaaga caaattgatc atttttatga gggaaataat atcattggca 660  
 ggtggattta gtattgctga ttttttcctt acatggaaaa tgattcatga tattgatgg 720  
 tcgaaatcta aactggtgaa agcacatcgt aagattgatg aaattttggg aaatgttgtt 780  
 gatgagcaca aaaagaacag agcagatggc aagaagggtta atggtgaatt tgggtggtgaa 840  
 gatttgattg atgtattgtt aagagttaga gaaagtggag aagttcaaatt tcctatcaca 900  
 aatgacaata tcaaatcaat attaatcgac atgttctctg cgggatctga aacatcatcg 960  
 acgactataa tttgggcatt agctgaaatg atgaagaaac caagtgtttt agcaaaggca 1020  
 caagctgaag taaggcaagc tttgaaggag aaaaaagggtt ttcaacagat tgatcttgat 1080  
 gagctaaaat atctcaagtt agtaatcaaa gaaaccttaa gaatgcaccc tccaattcct 1140  
 ctattagttc ctagagaatg tatggaggat acaaagattg atgggttaca tatacctttc 1200  
 aaaacaagag tcatagttaa tgcattgggca atcggacgag atccagaaag ttgggatgac 1260  
 cccgaaagct ttatgccaga gagatttgag aatagttcta ttgactttct tggaaatcat 1320  
 catcagttta taccatttgg tgcaggaaga aggatttgtc cgggaatgct atttggttta 1380  
 gctaattgtg gacaaccttt agctcagtta ctttatcact tcgattggaa actccctaatt 1440  
 ggacaaagtc atgagaattt cgacatgact ggtcacctg gaatttctgc tacaagaaag 1500

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gatgatcttg ttttgattgc cactccttat gattcttatt aagcagtagc agaaataaaa 1560  
agccggggca aacagaaaaa a 1581

<210> 152  
<211> 503  
<212> PRT  
<213> NICOTIANATABACUM  
<400> 152

Met Glu Ile Gln Phe Ser Asn Leu Val Ala Phe Leu Leu Phe Leu Ser  
1 5 10 15

Ser Ile Phe Leu Leu Phe Lys Lys Trp Lys Thr Arg Lys Leu Asn Leu  
20 25 30

Pro Pro Gly Pro Trp Lys Leu Pro Phe Ile Gly Ser Leu His His Leu  
35 40 45

Ala Val Ala Gly Pro Leu Pro His His Gly Leu Lys Asn Leu Ala Lys  
50 55 60

Arg Tyr Gly Pro Leu Met His Leu Gln Leu Gly Gln Ile Pro Thr Leu  
65 70 75 80

Ile Ile Ser Ser Pro Gln Met Ala Lys Glu Val Leu Lys Thr His Asp  
85 90 95

Leu Ala Phe Ala Thr Arg Pro Lys Leu Val Val Ala Asp Ile Ile His  
100 105 110

Tyr Asp Ser Thr Asp Ile Ala Phe Ser Pro Tyr Gly Glu Tyr Trp Arg  
115 120 125

Gln Ile Arg Lys Ile Cys Ile Leu Glu Leu Leu Ser Ala Lys Met Val  
130 135 140

Lys Phe Phe Ser Ser Ile Arg Gln Asp Glu Leu Ser Lys Met Leu Ser  
145 150 155 160

Ser Ile Arg Thr Thr Pro Asn Leu Thr Val Asn Leu Thr Asp Lys Ile  
165 170 175

Phe Trp Phe Thr Ser Ser Val Thr Cys Arg Ser Ala Leu Gly Lys Ile  
180 185 190

Cys Gly Asp Gln Asp Lys Leu Ile Ile Phe Met Arg Glu Ile Ile Ser  
195 200 205

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Leu Ala Gly Gly Phe Ser Ile Ala Asp Phe Phe Pro Thr Trp Lys Met  
210 215 220

Ile His Asp Ile Asp Gly Ser Lys Ser Lys Leu Val Lys Ala His Arg  
225 230 235

Lys Ile Asp Glu Ile Leu Gly Asn Val Val Asp Glu His Lys Lys Asn  
245 250

Arg Ala Asp Gly Lys Lys Gly Asn Gly Glu Phe Gly Gly Glu Asp Leu  
260 265 270

Ile Asp Val Leu Leu Arg Val Arg Glu Ser Gly Glu Val Gln Ile Pro  
275 280 285

Ile Thr Asn Asp Asn Ile Lys Ser Ile Leu Ile Asp Met Phe Ser Ala  
290 295 300

Gly Ser Glu Thr Ser Ser Thr Thr Ile Ile Trp Ala Leu Ala Glu Met  
305 310 315 320

Met Lys Lys Pro Ser Val Leu Ala Lys Ala Gln Ala Glu Val Arg Gln  
325 330 335

Ala Leu Lys Glu Lys Lys Gly Phe Gln Gln Ile Asp Leu Asp Glu Leu  
340 345 350

Lys Tyr Leu Lys Leu Val Ile Lys Glu Thr Leu Arg Met His Pro Pro  
355 360 365

Ile Pro Leu Leu Val Pro Arg Glu Cys Met Glu Asp Thr Lys Ile Asp  
370 375 380

Gly Tyr Asn Ile Pro Phe Lys Thr Arg Val Ile Val Asn Ala Trp Ala  
385 390 395 400

Ile Gly Arg Asp Pro Glu Ser Trp Asp Asp Pro Glu Ser Phe Met Pro  
405 410 415

Glu Arg Phe Glu Asn Ser Ser Ile Asp Phe Leu Gly Asn His His Gln  
420 425 430

Phe Ile Pro Phe Gly Ala Gly Arg Arg Ile Cys Pro Gly Met Leu Phe  
435 440 445

Gly Leu Ala Asn Val Gly Gln Pro Leu Ala Gln Leu Leu Tyr His Phe

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450

455

460

Asp Trp Lys Leu Pro Asn Gly Gln Ser His Glu Asn Phe Asp Met Thr  
465 470 475 480

Glu Ser Pro Gly Ile Ser Ala Thr Arg Lys Asp Asp Leu Val Leu Ile  
485 490 495

Ala Thr Pro Tyr Asp Ser Tyr  
500

<210> 153  
<211> 1538  
<212> DNA  
<213> NICOTIANATABACUM

<400> 153  
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tcctatttct atcttttctc tttttgtaa ggaaatggaa gaactcgaat agccaaagga 120  
aaaaattgcc accaggtcca tggaaactac caatactagg aagtatgctt catatgggtg 180  
gtggactacc acaccatgtc cttagagatt tagccaaaaa atatggaccg cttatgcacc 240  
ttcaattagg tgaagtttct gcagttgtgg ttacttctcc tgatatggca aaagaagtac 300  
taaaaactca tgacatcgct ttcgcgtcta ggcctagcct tttggccccg gagattgtct 360  
gttacaatag gtctgatctt gcgttttgcc cctatggcga ttattggaga caaatgcgta 420  
aaatatgtgt cttggaagtg ctcagtgcca agaatgttcg gacatatagc tctattaggc 480  
gcatgaagt tcttcgtctc cttaatttta tccggtcatc ttctggtgag cctgttaata 540  
ttacggaaag gatctttttg ttcacaagct ccatgacatg tagatcagcg tttgggcaag 600  
tattcaagga gcaagacaaa ttatacaac taattaaaga agttatactc ttagcaggag 660  
ggtttgatgt ggctgacata ttcccttcat acaagtctct tcatgtgctc agtggaatga 720  
agggtaagat tatgaatgca caccataagg tagatgctat tgttgagaat gtcacaaacg 780  
agcacaagaa aaatcttgca attgggaaaa ctaatggagc gttaggaggt gaagatttaa 840  
ttgatgttct tctaaaactt atgaatgatg gaggccttca atttcctatc accaacgaca 900  
acatcaaagc tataatcttt gacatgtttg ctgctggaac agagacttca tcgtcaacaa 960  
ttgtgtgggc tatggtggaa atggtgaaaa atccaactgt atttgcgaaa gctcaagcag 1020  
aagtaagaga tgcatttaga gaaaaagaaa cttttgatga aaatgatgtg gaggagctaa 1080  
actatctaaa gttagtcatt aaagaaactc taagacttca tccaccggtt ccacttttgc 1140  
tccaagaga atgtagggaa gagacaaata taaacggcta cactattcct gtaaagacca 1200  
aagtcatggt taatgttttg gcattgggaa gagatccaaa atattgggat gatgcagaaa 1260

## 79601-7270 Sequence Listing v2 -03-25-04.ST25

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cttttaagcc agagagattt gagcagtgt ctaaggattt tgttggtaat aattttgaat 1320
atcttccatt tgggtggtgga aggaggattt gtccagggat ttcgtttggt ttagctaata 1380
cttatttgcc attggctcaa ttactttatc actttgattg ggaactcccc actggaatca 1440
aaccaagcga cttggacttg actgagttgg ttggagtaac tgccgctaga aaaagtgacc 1500
tttacttggg tgcgactcct tatcaacctc ctcaaaac 1538

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```

<210> 154
<211> 502
<212> PRT
<213> NICOTIANATABACUM

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<400> 154

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```

Met Gln Phe Phe Ser Leu Val Ser Ile Phe Leu Phe Leu Ser Phe Leu
1          5          10          15

```

```

Phe Leu Leu Arg Lys Trp Lys Asn Ser Asn Ser Gln Arg Lys Lys Leu
          20          25          30

```

```

Pro Pro Gly Pro Trp Lys Leu Pro Ile Leu Gly Ser Met Leu His Met
          35          40          45

```

```

Val Gly Gly Leu Pro His His Val Leu Arg Asp Leu Ala Lys Lys Tyr
          50          55          60

```

```

Gly Pro Leu Met His Leu Gln Leu Gly Glu Val Ser Ala Val Val Val
65          70          75          80

```

```

Thr Ser Pro Asp Met Ala Lys Glu Val Leu Lys Thr His Asp Ile Ala
          85          90          95

```

```

Phe Ala Ser Arg Pro Ser Leu Leu Ala Pro Glu Ile Val Cys Tyr Asn
          100          105          110

```

```

Arg Ser Asp Leu Ala Phe Cys Pro Tyr Gly Asp Tyr Trp Arg Gln Met
          115          120          125

```

```

Arg Lys Ile Cys Val Leu Glu Val Leu Ser Ala Lys Asn Val Arg Thr
          130          135          140

```

```

Tyr Ser Ser Ile Arg Arg Asp Glu Val Leu Arg Leu Leu Asn Phe Ile
          145          150          155          160

```

```

Arg Ser Ser Ser Gly Glu Pro Val Asn Ile Thr Glu Arg Ile Phe Leu
          165          170          175

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Phe Thr Ser Ser Met Thr Cys Arg Ser Ala Phe Gly Gln Val Phe Lys

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180

185

190

Glu Gln Asp Lys Phe Ile Gln Leu Ile Lys Glu Val Ile Leu Leu Ala  
 195 200 205

Gly Gly Phe Asp Val Ala Asp Ile Phe Pro Ser Tyr Lys Ser Leu His  
 210 215 220

Val Leu Ser Gly Met Lys Gly Lys Ile Met Asn Ala His His Lys Val  
 225 230 235 240

Asp Ala Ile Val Glu Asn Val Ile Asn Glu His Lys Lys Asn Leu Ala  
 245 250 255

Ile Gly Lys Thr Asn Gly Ala Leu Gly Gly Glu Asp Leu Ile Asp Val  
 260 265 270

Leu Leu Lys Leu Met Asn Asp Gly Gly Leu Gln Phe Pro Ile Thr Asn  
 275 280 285

Asp Asn Ile Lys Ala Ile Ile Phe Asp Met Phe Ala Ala Gly Thr Glu  
 290 295 300

Thr Ser Ser Ser Thr Ile Val Trp Ala Met Val Glu Met Val Lys Asn  
 305 310 315 320

Pro Thr Val Phe Ala Lys Ala Gln Ala Glu Val Arg Asp Ala Phe Arg  
 325 330 335

Glu Lys Glu Thr Phe Asp Glu Asn Asp Val Glu Glu Leu Asn Tyr Leu  
 340 345 350

Lys Leu Val Ile Lys Glu Thr Leu Arg Leu His Pro Pro Val Pro Leu  
 355 360 365

Leu Leu Pro Arg Glu Cys Arg Glu Glu Thr Asn Ile Asn Gly Tyr Thr  
 370 375 380

Ile Pro Val Lys Thr Lys Val Met Val Asn Val Trp Ala Leu Gly Arg  
 385 390 395 400

Asp Pro Lys Tyr Trp Asp Asp Ala Glu Thr Phe Lys Pro Glu Arg Phe  
 405 410 415

Glu Gln Cys Ser Lys Asp Phe Val Gly Asn Asn Phe Glu Tyr Leu Pro  
 420 425 430



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Phe Gly Gly Gly Arg Arg Ile Cys Pro Gly Ile Ser Phe Gly Leu Ala  
 435 440 445

Asn Ala Tyr Leu Pro Leu Ala Gln Leu Leu Tyr His Phe Asp Trp Glu  
 450 455 460

Leu Pro Thr Gly Ile Lys Pro Ser Asp Leu Asp Leu Thr Glu Leu Val  
 465 470 475 480

Gly Val Thr Ala Ala Arg Lys Ser Asp Leu Tyr Leu Val Ala Thr Pro  
 485 490 495

Tyr Gln Pro Pro Gln Asn  
 500

<210> 155  
 <211> 1530  
 <212> DNA  
 <213> NICOTIANATABACUM

<400> 155  
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 aaatcccagg agactatggg tttccccttt ttggagccat aaaagataga tatgactact 120  
 tctacaacct cggcacagac gaattctttc ttacccaaaat gcaaaaatac aactctactg 180  
 tctttagaac caacatgcca ccagggtccat tcattgctaa aaatcccaaa gtaattgttc 240  
 tcctcgatgc caaaacattt cccgttcttt tcgacaactc taaagtcgaa aaaatgaacg 300  
 ttcttgatgg cacgtacgtg ccatctactg atttctatgg cgatatcgc ccgtgtgctt 360  
 atcttgatcc ttctgagtca actcatgcca cacttaaagg gttcttttta tctttaatct 420  
 cccagcttca taatcaattt attcctttat ttagaacctc aatttctggg tttttcgcaa 480  
 atcttgagaa tgagatttcc caaaatggca aagcgaactt caacaatatc agcgacatta 540  
 tgtcattcga ttttgttttt cgtttgttat gtgacaagac cagtcccat gacacaaatc 600  
 ttggctctaa tggacaaaaa ctctttgata tatggctgtt gcctcaactt gctccattgt 660  
 ttagtctagg tctaaaattt gtgccgaact ttctggaaga tttaatgttg catacttttc 720  
 ccttgccatt ttttctagt agatcgaatt accagaagct ttatgatgct tttagcaagc 780  
 atgccgaaag taaactgaat gaagcagaga agaattggg gatgaaagtt ttattccctg 840  
 acaacttagt ttttcttgca gggttcaatg cttatgggtg gatgaaagtt ttattccctg 900  
 cactgataaa gtgggtcgcc aatggaggaa agagtttaca cactcggctg gcaaatgaaa 960  
 tcaggacaat tatcaaagaa gaatgtggga ccataactct atcagcaatc aacaagatga 1020  
 gtttagtaaa atcagtagtg tatgaagtat taagaattga acctccagtt ccattccaat 1080  
 atggtaaaagc caaagaagat atcataatcc aaagccatga ttcaactttc ttagtcaaga 1140

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aaggtgaaat gatctttgga tatcagcctt ttgctacaaa agatccaaag atttttgaca 1200
aaccagagga gtttattccg gagagggttca tggccgaagg ggaaaaatta ttaaagtatg 1260
tgtattggtc aaatgcaaga gagacagatg atccaacggt ggacaacaaa caatgcccag 1320
cgaaaaatct tgtcgtgctt ttgtgcaggt tgatgttggt ggagggtttc atgcgttacg 1380
acacattcac agtggagtca acaaagctct ttcttggggtc atcagtaacg ttcacgactc 1440
tggaaaaagc gacatgagtt tcagatatct taattgtagg ctgcaaataa taatgtgggtc 1500
attctgcaaa ttattgtact tgtgctgatg 1530

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<210> 156  
 <211> 483  
 <212> PRT  
 <213> NICOTIANATABACUM

<400> 156

Met Ser Ser Phe Ser Thr Ser Ser Ala Thr Ser Asn Ser Lys Leu Pro  
1 5 10 15

Val Arg Glu Ile Pro Gly Asp Tyr Gly Phe Pro Phe Phe Gly Ala Ile  
20 25 30

Lys Asp Arg Tyr Asp Tyr Phe Tyr Asn Leu Gly Thr Asp Glu Phe Phe  
35 40 45

Leu Thr Lys Met Gln Lys Tyr Asn Ser Thr Val Phe Arg Thr Asn Met  
50 55 60

Pro Pro Gly Pro Phe Ile Ala Lys Asn Pro Lys Val Ile Val Leu Leu  
65 70 75 80

Asp Ala Lys Thr Phe Pro Val Leu Phe Asp Asn Ser Lys Val Glu Lys  
85 90 95

Met Asn Val Leu Asp Gly Thr Tyr Val Pro Ser Thr Asp Phe Tyr Gly  
100 105 110

Gly Tyr Arg Pro Cys Ala Tyr Leu Asp Pro Ser Glu Ser Thr His Ala  
115 120 125

Thr Leu Lys Gly Phe Phe Leu Ser Leu Ile Ser Gln Leu His Asn Gln  
130 135 140

Phe Ile Pro Leu Phe Arg Thr Ser Ile Ser Gly Leu Phe Ala Asn Leu  
145 150 155 160

## 79601-7270 Sequence Listing v2 -03-25-04.ST25

Glu Asn Glu Ile Ser Gln Asn Gly Lys Ala Asn Phe Asn Asn Ile Ser  
 165 170 175  
 Asp Ile Met Ser Phe Asp Phe Val Phe Arg Leu Leu Cys Asp Lys Thr  
 180 185 190  
 Ser Pro His Asp Thr Asn Leu Gly Ser Asn Gly Pro Lys Leu Phe Asp  
 195 200 205  
 Ile Trp Leu Leu Pro Gln Leu Ala Pro Leu Phe Ser Leu Gly Leu Lys  
 210 215 220  
 Phe Val Pro Asn Phe Leu Glu Asp Leu Met Leu His Thr Phe Pro Leu  
 225 230 235 240  
 Pro Phe Phe Leu Val Arg Ser Asn Tyr Gln Lys Leu Tyr Asp Ala Phe  
 245 250 255  
 Ser Lys His Ala Glu Ser Thr Leu Asn Glu Ala Glu Lys Asn Gly Ile  
 260 265 270  
 Lys Arg Asp Glu Ala Cys His Asn Leu Val Phe Leu Ala Gly Phe Asn  
 275 280 285  
 Ala Tyr Gly Gly Met Lys Val Leu Phe Pro Ala Leu Ile Lys Trp Val  
 290 295 300  
 Ala Asn Gly Gly Lys Ser Leu His Thr Arg Leu Ala Asn Glu Ile Arg  
 305 310 315 320  
 Thr Ile Ile Lys Glu Glu Cys Gly Thr Ile Thr Leu Ser Ala Ile Asn  
 325 330 335  
 Lys Met Ser Leu Val Lys Ser Val Val Tyr Glu Val Leu Arg Ile Glu  
 340 345 350  
 Pro Pro Val Pro Phe Gln Tyr Gly Lys Ala Lys Glu Asp Ile Ile Ile  
 355 360 365  
 Gln Ser His Asp Ser Thr Phe Leu Val Lys Lys Gly Glu Met Ile Phe  
 370 375 380  
 Gly Tyr Gln Pro Phe Ala Thr Lys Asp Pro Lys Ile Phe Asp Lys Pro  
 385 390 395 400  
 Glu Glu Phe Ile Pro Glu Arg Phe Met Ala Glu Gly Glu Lys Leu Leu  
 405 410 415

79601-7270 Sequence Listing v2 -03-25-04.ST25

Lys Tyr Val Tyr Trp Ser Asn Ala Arg Glu Thr Asp Asp Pro Thr Val  
420 425 430

Asp Asn Lys Gln Cys Pro Ala Lys Asn Leu Val Val Leu Leu Cys Arg  
435 440 445

Leu Met Leu Val Glu Val Phe Met Arg Tyr Asp Thr Phe Thr Val Glu  
450 455 460

Ser Thr Lys Leu Phe Leu Gly Ser Ser Val Thr Phe Thr Thr Leu Glu  
465 470 475 480

Lys Ala Thr

<210> 157  
<211> 1593  
<212> DNA  
<213> NICOTIANATABACUM

<400> 157  
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tttcatttta ttctagtga gaaatggaat gccaaaatcc caaagttacc tccaggtccg 120  
tggaggcttc cttttattgg aagcctccat cacttgaagg gaaaacttcc acaccataat 180  
cttagagatc tagcgcgaaa atatgggcct ctcatgtact tacaactcgg agaaattcct 240  
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tcttttgccc catttggtga ttactggaga cagatgcgta aaatattgac tcaggaactc 420  
ctgagtaaca agatgctcaa gtcatatagc ttaatccgaa aggatgagct ctcgaagctc 480  
ctctcatcga ttcgtttgga aacaggttct gcagtgaaca taaatgaaaa gcttctctgg 540  
tttacgagct gcatgacctg tagattagcc tttggaaaaa tatgcaatga tcgggatgag 600  
ttgatcatgc taattagga gatattaaca ttatcaggag gatttgatgt gggtgatttg 660  
ttcccttcct ggaaattact tcataatatg agcaacatga aagctagggt gacgaatgta 720  
caccacaagt atgatttagt tatggagaac atcatcaatg agcaccaaga gaatcatgca 780  
gcagggataa agggtaacaa cgagtttggt ggcgaagata tgatcgatgc tctactgagg 840  
gctaaggaga ataatgagct tcaatttcct atcgaaaatg acaacatgaa agcagtaatt 900  
ctggacttgt ttattgctgg aactgaaact tcatatactg caattatatg ggcactatca 960  
gaattgatga agcaccacaag tgtgatggcc aaggcacaag ctgaagtgag aaaagtcttc 1020  
aaagaaaatg aaaatttcga cgaaaatgat cttgacaagt tgccatactt aaaatcagtg 1080

79601-7270 Sequence Listing v2 -03-25-04.ST25

attaaagaaa cactaaggat gcaccctcca gttcctttgt tagggcctag agaatgcagg	1140
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tgggcgatag gaagagatcc tgaaagtgg gaagatcctg aaagtttcaa accggagcga	1260
tttgaaaata cttctgttga tcttacagga aatcactatc agttcattcc tttcggttca	1320
ggaagaagaa tgtgtccagg aatgtcgttt ggtttagtta acacagggca tcctttagcc	1380
cagttgctct attgctttga ctggaaactc cctgacaagg ttaatgcaaa tgattttcgc	1440
actactgaaa caagtagagt ttttgcagca agcaaagatg acctctactt gattcccaca	1500
aatcacaggg agcaagaata gcttaattta atggagttct tggaagaatt aaagaagaag	1560
ggctatatag gtgagatttt ttgtatggtt gca	1593

<210> 158  
 <211> 504  
 <212> PRT  
 <213> NICOTIANATABACUM

<400> 158

Met	Glu	Leu	Gln	Ser	Ser	Pro	Phe	Asn	Leu	Ile	Ser	Leu	Phe	Leu	Phe
1				5					10					15	

Phe	Ser	Phe	His	Phe	Ile	Leu	Val	Lys	Lys	Trp	Asn	Ala	Lys	Ile	Pro
			20					25					30		

Lys	Leu	Pro	Pro	Gly	Pro	Trp	Arg	Leu	Pro	Phe	Ile	Gly	Ser	Leu	His
		35					40					45			

His	Leu	Lys	Gly	Lys	Leu	Pro	His	His	Asn	Leu	Arg	Asp	Leu	Ala	Arg
	50					55					60				

Lys	Tyr	Gly	Pro	Leu	Met	Tyr	Leu	Gln	Leu	Gly	Glu	Ile	Pro	Val	Val
65					70					75					80

Val	Ile	Ser	Ser	Pro	Arg	Val	Ala	Lys	Ala	Val	Leu	Lys	Thr	His	Asp
				85					90					95	

Leu	Ala	Phe	Ala	Thr	Arg	Pro	Arg	Phe	Met	Ser	Ser	Asp	Ile	Val	Phe
			100					105					110		

Tyr	Lys	Ser	Arg	Asp	Ile	Ser	Phe	Ala	Pro	Phe	Gly	Asp	Tyr	Trp	Arg
		115					120					125			

Gln	Met	Arg	Lys	Ile	Leu	Thr	Gln	Glu	Leu	Leu	Ser	Asn	Lys	Met	Leu
	130					135					140				

Lys	Ser	Tyr	Ser	Leu	Ile	Arg	Lys	Asp	Glu	Leu	Ser	Lys	Leu	Leu	Ser
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145																
Ser	Ile	Arg	Leu	Glu 165	Thr	Gly	Ser	Ala	Val 170	Asn	Ile	Asn	Glu	Lys 175	Leu	
Leu	Trp	Phe	Thr 180	Ser	Cys	Met	Thr	Cys 185	Arg	Leu	Ala	Phe	Gly 190	Lys	Ile	
Cys	Asn	Asp 195	Arg	Asp	Glu	Leu	Ile 200	Met	Leu	Ile	Arg	Glu 205	Ile	Leu	Thr	
Leu	Ser 210	Gly	Gly	Phe	Asp	Val 215	Gly	Asp	Leu	Phe	Pro 220	Ser	Trp	Lys	Leu	
Leu 225	His	Asn	Met	Ser	Asn 230	Met	Lys	Ala	Arg	Leu 235	Thr	Asn	Val	His	His 240	
Lys	Tyr	Asp	Leu	Val 245	Met	Glu	Asn	Ile	Ile 250	Asn	Glu	His	Gln	Glu 255	Asn	
His	Ala	Ala	Gly 260	Ile	Lys	Gly	Asn	Asn 265	Glu	Phe	Gly	Gly	Glu 270	Asp	Met	
Ile	Asp	Ala 275	Leu	Leu	Arg	Ala	Lys 280	Glu	Asn	Asn	Glu	Leu 285	Gln	Phe	Pro	
Ile	Glu 290	Asn	Asp	Asn	Met	Lys 295	Ala	Val	Ile	Leu	Asp 300	Leu	Phe	Ile	Ala	
Gly 305	Thr	Glu	Thr	Ser	Tyr 310	Thr	Ala	Ile	Ile	Trp 315	Ala	Leu	Ser	Glu	Leu 320	
Met	Lys	His	Pro	Ser 325	Val	Met	Ala	Lys	Ala 330	Gln	Ala	Glu	Val	Arg 335	Lys	
Val	Phe	Lys	Glu 340	Asn	Glu	Asn	Phe	Asp 345	Glu	Asn	Asp	Leu	Asp 350	Lys	Leu	
Pro	Tyr	Leu 355	Lys	Ser	Val	Ile	Lys 360	Glu	Thr	Leu	Arg	Met 365	His	Pro	Pro	
Val	Pro 370	Leu	Leu	Gly	Pro	Arg 375	Glu	Cys	Arg	Asp	Gln 380	Thr	Glu	Ile	Asp	
Gly 385	Tyr	Thr	Val	Pro	Ile 390	Lys	Ala	Arg	Val	Met 395	Val	Asn	Ala	Trp	Ala 400	

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Ile Gly Arg Asp Pro Glu Ser Trp Glu Asp Pro Glu Ser Phe Lys Pro  
405 410 415

Glu Arg Phe Glu Asn Thr Ser Val Asp Leu Thr Gly Asn His Tyr Gln  
420 425 430

Phe Ile Pro Phe Gly Ser Gly Arg Arg Met Cys Pro Gly Met Ser Phe  
435 440 445

Gly Leu Val Asn Thr Gly His Pro Leu Ala Gln Leu Leu Tyr Cys Phe  
450 455 460

Asp Trp Lys Leu Pro Asp Lys Val Asn Ala Asn Asp Phe Arg Thr Thr  
465 470 475 480

Glu Thr Ser Arg Val Phe Ala Ala Ser Lys Asp Asp Leu Tyr Leu Ile  
485 490 495

Pro Thr Asn His Arg Glu Gln Glu  
500

<210> 159  
<211> 1599  
<212> DNA  
<213> NICOTIANATABACUM

<400> 159  
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ggtccgtgga ggcttccctt tattggaagc ctccatcact tgaagggaaa acttccacac 180  
cataatctta gagatctagc gcgaaaatat ggacctctca tgtacttaca actcgagaaa 240  
attcctgtag ttgtaatatc ttcgccacgt gtagcaaaaag ctgtactaaa aactcatgat 300  
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gacatctctt ttgccccatt tgggtgattac tggagacaga tgcgtaaaat attgactcag 420  
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ctctggttta cgagctgcat gacctgtaga ttagcctttg gaaaaatatg caatgatcgg 600  
gatgagttga tcatgctaata tagggagata ttaacattat caggaggatt tgatgtgggt 660  
gatttggtcc cttcctggaa attacttcat aatatgagca acatgaaagc taggttgacg 720  
aatgtacacc acaagtatga tttagttatg gagaacatca tcaatgagca ccaagagaat 780  
catgcagcag ggataaaggg taacaacgag tttggtggcg aagatatgat cgatgctcta 840  
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tcagtgatta aagaaacact aaggatgcac cctccagttc ctttgttagg gcctagagaa    1140
tgcagggacc aaacagagat cgatggctac actgtaccta ttaaagctag agttatgggt    1200
aatgcttggg cgataggaag agatcctgaa agttgggaag atcctgaaag tttcaaaccg    1260
gagcgatttg aaaatacttc tgttgatctt acaggaaatc actatcagtt cattcctttc    1320
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ttagccagtg tgctctattg ctttgactgg aaactccctg acaagggtta tgcaaagat    1440
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cccacaaatc acagggagca agaatagctt aatttaatgg agttcttgga agaattaaag    1560
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<210> 160  
 <211> 504  
 <212> PRT  
 <213> NICOTIANATABACUM

<400> 160

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Phe Ser Phe Leu Phe Ile Leu Val Lys Lys Trp Asn Ala Lys Ile Pro  
 20 25 30

Lys Leu Pro Pro Gly Pro Trp Arg Leu Pro Phe Ile Gly Ser Leu His  
 35 40 45

His Leu Lys Gly Lys Leu Pro His His Asn Leu Arg Asp Leu Ala Arg  
 50 55 60

Lys Tyr Gly Pro Leu Met Tyr Leu Gln Leu Gly Glu Ile Pro Val Val  
 65 70 75 80

Val Ile Ser Ser Pro Arg Val Ala Lys Ala Val Leu Lys Thr His Asp  
 85 90 95

Leu Ala Phe Ala Thr Arg Pro Arg Phe Met Ser Ser Asp Ile Val Phe  
 100 105 110

Tyr Lys Ser Arg Asp Ile Ser Phe Ala Pro Phe Gly Asp Tyr Trp Arg  
 115 120 125



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Gln Met Arg Lys Ile Leu Thr Gln Glu Leu Leu Ser Asn Lys Met Leu  
130 135 140

Lys Ser Tyr Ser Leu Ile Arg Lys Asp Glu Leu Ser Lys Leu Leu Ser  
145 150 155 160

Ser Ile Arg Leu Glu Thr Gly Ser Ala Val Asn Ile Asn Glu Lys Leu  
165 170 175

Leu Trp Phe Thr Ser Cys Met Thr Cys Arg Leu Ala Phe Gly Lys Ile  
180 185 190

Cys Asn Asp Arg Asp Glu Leu Ile Met Leu Ile Arg Glu Ile Leu Thr  
195 200 205

Leu Ser Gly Gly Phe Asp Val Gly Asp Leu Phe Pro Ser Trp Lys Leu  
210 215 220

Leu His Asn Met Ser Asn Met Lys Ala Arg Leu Thr Asn Val His His  
225 230 235 240

Lys Tyr Asp Leu Val Met Glu Asn Ile Ile Asn Glu His Gln Glu Asn  
245 250 255

His Ala Ala Gly Ile Lys Gly Asn Asn Glu Phe Gly Gly Glu Asp Met  
260 265 270

Ile Asp Ala Leu Leu Arg Ala Lys Glu Asn Asn Glu Leu Gln Phe Pro  
275 280 285

Ile Glu Asn Asp Asn Met Lys Ala Val Ile Leu Asp Leu Phe Ile Ala  
290 295 300

Gly Thr Glu Thr Ser Tyr Thr Ala Ile Ile Trp Ala Leu Ser Glu Leu  
305 310 315 320

Met Lys His Pro Ser Val Met Ala Lys Ala Gln Ala Glu Val Arg Lys  
325 330 335

Val Phe Lys Glu Asn Glu Asn Phe Asp Glu Asn Asp Leu Asp Lys Leu  
340 345 350

Pro Tyr Leu Lys Ser Val Ile Lys Glu Thr Leu Arg Met His Pro Pro  
355 360 365

Val Pro Leu Leu Gly Pro Arg Glu Cys Arg Asp Gln Thr Glu Ile Asp

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370

375

380

Gly Tyr Thr Val Pro Ile Lys Ala Arg Val Met Val Asn Ala Trp Ala  
385 390 395 400

Ile Gly Arg Asp Pro Glu Ser Trp Glu Asp Pro Glu Ser Phe Lys Pro  
405 410 415

Glu Arg Phe Glu Asn Thr Ser Val Asp Leu Thr Gly Asn His Tyr Gln  
420 425 430

Phe Ile Pro Phe Gly Ser Gly Arg Arg Met Cys Pro Gly Met Ser Phe  
435 440 445

Gly Leu Val Asn Thr Gly His Pro Leu Ala Gln Leu Leu Tyr Cys Phe  
450 455 460

Asp Trp Lys Leu Pro Asp Lys Val Asn Ala Asn Asp Phe Arg Thr Thr  
465 470 475 480

Glu Thr Ser Arg Val Phe Ala Ala Ser Lys Asp Asp Leu Tyr Leu Ile  
485 490 495

Pro Thr Asn His Arg Glu Gln Glu  
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<210> 161  
<211> 1564  
<212> DNA  
<213> NICOTIANATABACUM

<400> 161  
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gaggctacct attattggaa gtgtgcatca cttgacaagt ggagtaccac atcgagttct 180  
cagaaattta tcacaaaaat ttggcccgat catgtacttg cagctcgggg aagttcccac 240  
agtagttgta tcctccccac acatggccaa acaaatttta aaaactcatg acctcgcttt 300  
tgcattctagg ccagaaatca tgatgggaaa aattatttgc tacgattgta aggacattgc 360  
cttttccccg tatggtgatt attggagaca tatgcgtaaa ttgagcacct tggaactact 420  
tagtgccaag atggtcaagt ccttcagtcc aattcgtcaa gatgagctct caagtctcct 480  
atcatccatt gaatcaatgg gaaatttgcc aatcaactta gtagaaaaac ttttatgggt 540  
tatgaatgcc gcgacatgta ggtcagcatt tgggaaaagt tgtaaagatc aaaaagagtt 600  
gataacattg attcaacgag cagaatcatt atctggtgga ttcgagctgg ctgatttgtt 660

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tggaatatgt tgtaatggtg agtctggaac tgtagatttc atcgatgttt ttctaaggg	840
catggagagt ggcgaattac cttttccgat agaaaatgac aacatcaaag cagttattct	900
tgacatgttc gtagcaggat ctgacacatc atcttcaacc gttatttggg cattaacaga	960
aatgatgaag aatccaaaag tcatggctaa agcacaagct gaagtgagag aagcttttaa	1020
aggaaaagaaa gcatgtgatg aggatactga tcttgaaaag cttcattacc taaatttagt	1080
gatcaaagag aactccgat tacaccctcc aactcctcta cttgtcccgc gagaatgcag	1140
ggaggaaaca gagatagaag gattcactat accattgaaa agcaaagtct tggttaacgt	1200
atgggcaatt ggaagagatc ccgagaattg gaaaaatcct gaatgtttta taccagagag	1260
attcgaaaat agttctattg agtttactgg aaatcatttt caacttcttc cgtttggcgc	1320
tggaagacga atttgtccag gaatgcaatt tggtttggct cttgttactc tgccattggc	1380
tcatttgctt cacaattttg attggaaaact tcccgaagga attaatgcaa gggatttgga	1440
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cact	1564

<210> 162  
 <211> 501  
 <212> PRT  
 <213> NICOTIANATABACUM

<400> 162

Met Glu Phe Gln His Leu Val Ser Phe Leu Leu Phe Ile Ser Phe Ile  
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Phe Leu Leu Ile Gln Lys Trp Arg Lys Ser Lys Lys Leu Pro Pro Gly  
 20 25 30

Pro Trp Arg Leu Pro Ile Ile Gly Ser Val His His Leu Thr Ser Gly  
 35 40 45

Val Pro His Arg Val Leu Arg Asn Leu Ser Gln Lys Phe Gly Pro Ile  
 50 55 60

Met Tyr Leu Gln Leu Gly Glu Val Pro Thr Val Val Val Ser Ser Pro  
 65 70 75 80

His Met Ala Lys Gln Ile Leu Lys Thr His Asp Leu Ala Phe Ala Ser  
 85 90 95

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Arg Pro Glu Ile Met Met Gly Lys Ile Ile Cys Tyr Asp Cys Lys Asp  
100 105 110

Ile Ala Phe Ser Pro Tyr Gly Asp Tyr Trp Arg His Met Arg Lys Leu  
115 120 125

Ser Thr Leu Glu Leu Leu Ser Ala Lys Met Val Lys Ser Phe Ser Pro  
130 135 140

Ile Arg Gln Asp Glu Leu Ser Ser Leu Leu Ser Ser Ile Glu Ser Met  
145 150 155 160

Gly Asn Leu Pro Ile Asn Leu Val Glu Lys Leu Leu Trp Phe Met Asn  
165 170 175

Ala Ala Thr Cys Arg Ser Ala Phe Gly Lys Val Cys Lys Asp Gln Lys  
180 185 190

Glu Leu Ile Thr Leu Ile Gln Arg Ala Glu Ser Leu Ser Gly Gly Phe  
195 200 205

Glu Leu Ala Asp Leu Phe Pro Ser Lys Lys Phe Leu His Gly Ile Ser  
210 215 220

Gly Met Arg Ser Lys Leu Met Glu Ala Arg Asn Lys Ile Asp Ala Val  
225 230 235 240

Leu Asp Asn Ile Ile Asn Val His Arg Glu Asn Arg Ala Asn Gly Asn  
245 250 255

Ser Cys Asn Gly Glu Ser Gly Thr Val Asp Phe Ile Asp Val Phe Leu  
260 265 270

Arg Val Met Glu Ser Gly Glu Leu Pro Phe Pro Ile Glu Asn Asp Asn  
275 280 285

Ile Lys Ala Val Ile Leu Asp Met Phe Val Ala Gly Ser Asp Thr Ser  
290 295 300

Ser Ser Thr Val Ile Trp Ala Leu Thr Glu Met Met Lys Asn Pro Lys  
305 310 315 320

Val Met Ala Lys Ala Gln Ala Glu Val Arg Glu Ala Phe Lys Gly Lys  
325 330 335

Lys Ala Cys Asp Glu Asp Thr Asp Leu Glu Lys Leu His Tyr Leu Asn  
340 345 350

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Leu Val Ile Lys Glu Thr Leu Arg Leu His Pro Pro Thr Pro Leu Leu  
355 360 365

Val Pro Arg Glu Cys Arg Glu Glu Thr Glu Ile Glu Gly Phe Thr Ile  
370 375 380

Pro Leu Lys Ser Lys Val Leu Val Asn Val Trp Ala Ile Gly Arg Asp  
385 390 395 400

Pro Glu Asn Trp Lys Asn Pro Glu Cys Phe Ile Pro Glu Arg Phe Glu  
405 410 415

Asn Ser Ser Ile Glu Phe Thr Gly Asn His Phe Gln Leu Leu Pro Phe  
420 425 430

Gly Ala Gly Arg Arg Ile Cys Pro Gly Met Gln Phe Gly Leu Ala Leu  
435 440 445

Val Thr Leu Pro Leu Ala His Leu Leu His Asn Phe Asp Trp Lys Leu  
450 455 460

Pro Glu Gly Ile Asn Ala Arg Asp Leu Asp Met Thr Glu Ala Asn Gly  
465 470 475 480

Ile Ser Ala Arg Arg Glu Lys Asp Leu Tyr Leu Ile Ala Thr Pro Tyr  
485 490 495

Val Ser Pro Leu Asp  
500

<210> 163  
<211> 1560  
<212> DNA  
<213> NICOTIANATABACUM

<400> 163  
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ctacctatta ttggaagtgt gcatcacttg acaagtggag taccacatcg agttctcaga 180  
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tctaggccag aaatcatgat gggaaaaatt atttgctacg attgtaagga cattgccttt 360  
tccccgtatg gtgattattg gagacatatg cgtaaattga gcaccttgga actacttagt 420  
gccaaagatgg tcaagtcctt cagtccaatt cgtcaagatg agctctcaag tctcctatca 480

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<210> 164  
 <211> 501  
 <212> PRT  
 <213> NICOTIANATABACUM

<400> 164

Met Glu Phe Gln His Leu Val Ser Phe Leu Leu Phe Ile Ser Phe Ile  
 1 5 10 15

Phe Leu Leu Ile Gln Lys Trp Arg Lys Ser Lys Lys Leu Pro Pro Gly  
 20 25 30

Pro Trp Arg Leu Pro Ile Ile Gly Ser Val His His Leu Thr Ser Gly  
 35 40 45

Val Pro His Arg Val Leu Arg Asn Leu Ser Gln Lys Phe Gly Pro Ile  
 50 55 60

Met Tyr Leu Gln Leu Gly Glu Val Pro Thr Val Val Val Ser Ser Pro  
 65 70 75 80

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His Met Ala Lys Gln Ile Leu Lys Thr His Asp Leu Ala Phe Ala Ser  
85 90 95

Arg Pro Glu Ile Met Met Gly Lys Ile Ile Cys Tyr Asp Cys Lys Asp  
100 105 110

Ile Ala Phe Ser Pro Tyr Gly Asp Tyr Trp Arg His Met Arg Lys Leu  
115 120 125

Ser Thr Leu Glu Leu Leu Ser Ala Lys Met Val Lys Ser Phe Ser Pro  
130 135 140

Ile Arg Gln Asp Glu Leu Ser Ser Leu Leu Ser Ser Ile Glu Ser Met  
145 150 155 160

Gly Asn Leu Pro Ile Asn Leu Val Glu Lys Leu Leu Trp Phe Met Asn  
165 170 175

Ala Ala Thr Cys Arg Ser Ala Phe Gly Lys Val Cys Lys Asp Gln Lys  
180 185 190

Glu Leu Ile Thr Leu Ile Gln Arg Ala Glu Ser Leu Ser Gly Gly Phe  
195 200 205

Glu Leu Ala Asp Leu Phe Pro Ser Lys Lys Phe Leu His Gly Ile Ser  
210 215 220

Gly Met Arg Ser Lys Leu Met Glu Ala Arg Asn Lys Ile Asp Ala Val  
225 230 235 240

Leu Asp Asn Ile Ile Asn Val His Arg Glu Asn Arg Ala Asn Gly Asn  
245 250 255

Ser Cys Asn Gly Glu Ser Gly Thr Val Asp Phe Ile Asp Val Phe Leu  
260 265 270

Arg Val Met Glu Ser Gly Glu Leu Pro Phe Pro Ile Glu Asn Asp Asn  
275 280 285

Ile Lys Ala Val Ile Leu Asp Met Phe Val Ala Gly Ser Asp Thr Ser  
290 295 300

Ser Ser Thr Val Ile Trp Ala Leu Thr Glu Thr Met Lys Asn Pro Lys  
305 310 315 320

Val Met Ala Lys Ala Gln Ala Glu Val Arg Glu Ala Phe Lys Gly Lys

Lys Ala Cys Asp Glu Asp Thr Asp Leu Glu Lys His His Tyr Leu Asn  
340 345 350

Leu Val Ile Lys Glu Thr Leu Arg Leu His Pro Pro Thr Pro Leu Leu  
355 360 365

Val Pro Arg Glu Cys Arg Glu Glu Thr Glu Ile Glu Gly Phe Thr Ile  
370 375 380

Pro Leu Lys Ser Lys Val Leu Val Asn Val Trp Ala Ile Gly Arg Asp  
385 390 395 400

Pro Glu Asn Trp Lys Asn Pro Glu Cys Phe Ile Pro Glu Arg Phe Glu  
405 410 415

Asn Ser Ser Ile Glu Phe Thr Gly Asn His Phe Gln Leu Leu Pro Phe  
420 425 430

Gly Ala Gly Arg Arg Ile Cys Pro Gly Met Gln Phe Gly Leu Ala Leu  
435 440 445

Val Thr Leu Pro Leu Ala His Leu Leu His Asn Phe Asp Trp Lys Leu  
450 455 460

Pro Glu Gly Ile Asn Ala Arg Asp Leu Asp Met Thr Glu Ala Asn Gly  
465 470 475 480

Ile Ser Ala Arg Arg Glu Lys Asp Leu Tyr Leu Ile Ala Thr Pro Tyr  
485 490 495

Val Ser Pro Leu Asp  
500

<210> 165  
<211> 1552  
<212> DNA  
<213> NICOTIANATABACUM

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atttcttact ttccccttta ttggccatct ttatctcttc aaaaaaccac ttcaacgtac 180  
cttagccaaa atctccgaac gttatggctc tggtcttcta ctcgaattcg gttcacgaaa 240  
agtacttttg gtttcttcac catctgcagc tgaagaatgc ttaacaaaaa acgatattat 300



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gttttcgact catcgtcttc aaatgctaca tgggattcgt attgatgaag tgaaatctat	480
ggttaagagg ctcaattcct ctgccatagc tgaaaaatct gtggatatga agtctatgtt	540
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gattggcggg gcgacgaata ttggcgactt tttgccggcg ttgaagttat tggtgaggaa	720
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gaacaagaaa tgtttaattg aagttttgtt aacactacaa gaaaatgaac cggaatacta	900
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accactacta gtcccacacg agtcgtcaga ggaaaccacc gtaggaggct accgtgtacc	1200
cggaggaacc atgttacttg tgaatttgtg ggcaattcac aatgatccaa agctatggga	1260
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<210> 166

<211> 511

<212> PRT

<213> NICOTIANATABACUM

<400> 166

Met Val	Asn	Met	Phe	Thr	Pro	Ile	Ile	Tyr	Ala	Pro	Leu	Leu	Leu	Ala
1			5					10					15	

Phe	Tyr	Ile	Ile	Thr	Lys	His	Phe	Leu	Arg	Lys	Leu	Arg	Asn	Asn	Pro
		20						25					30		

Pro	Ala	Pro	Phe	Leu	Thr	Phe	Pro	Phe	Ile	Gly	His	Leu	Tyr	Leu	Phe
		35					40					45			

Lys	Lys	Pro	Leu	Gln	Arg	Thr	Leu	Ala	Lys	Ile	Ser	Glu	Arg	Tyr	Gly

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50

55

60

Ser Val Leu Leu Leu Glu Phe Gly Ser Arg Lys Val Leu Leu Val Ser  
65 70 75 80

Ser Pro Ser Ala Ala Glu Glu Cys Leu Thr Lys Asn Asp Ile Ile Phe  
85 90 95

Ala Asn Arg Pro Leu Leu Met Ala Gly Lys His Leu Gly Tyr Asn Phe  
100 105 110

Thr Ser Leu Ala Trp Ser Ser Tyr Gly Asp His Trp Arg Asn Leu Arg  
115 120 125

Arg Ile Thr Ser Val Glu Met Phe Ser Thr His Arg Leu Gln Met Leu  
130 135 140

His Gly Ile Arg Ile Asp Glu Val Lys Ser Met Val Lys Arg Leu Asn  
145 150 155 160

Ser Ser Ala Ile Ala Glu Lys Ser Val Asp Met Lys Ser Met Phe Phe  
165 170 175

Glu Leu Met Leu Asn Val Met Met Arg Thr Ile Ala Gly Lys Arg Tyr  
180 185 190

Tyr Gly Glu Asn Val Glu Asp Ile Glu Glu Ala Thr Arg Phe Lys Gly  
195 200 205

Leu Val Gln Glu Thr Phe Arg Ile Gly Gly Ala Thr Asn Ile Gly Asp  
210 215 220

Phe Leu Pro Ala Leu Lys Leu Leu Val Arg Lys Leu Glu Lys Ser Leu  
225 230 235 240

Ile Val Leu Gln Glu Asn Arg Asp Glu Phe Met Gln Glu Leu Ile Lys  
245 250 255

Asp Cys Arg Lys Arg Met Glu Lys Glu Gly Thr Val Thr Asp Ser Glu  
260 265 270

Ile Glu Gly Asn Lys Lys Cys Leu Ile Glu Val Leu Leu Thr Leu Gln  
275 280 285

Glu Asn Glu Pro Glu Tyr Tyr Lys Asp Glu Ile Ile Arg Ser Leu Met  
290 295 300

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Leu Val Leu Leu Ser Ala Gly Thr Asp Thr Ser Val Gly Thr Met Glu  
305 310 315 320

Trp Ala Leu Ser Leu Met Leu Asn His Pro Glu Thr Leu Lys Lys Ala  
325 330 335

Gln Ala Glu Ile Asp Glu His Ile Gly His Glu Arg Leu Val Asp Glu  
340 345 350

Ser Asp Ile Asn Asn Leu Pro Tyr Leu Arg Cys Ile Ile Asn Glu Thr  
355 360 365

Phe Arg Met Tyr Pro Ala Gly Pro Leu Leu Val Pro His Glu Ser Ser  
370 375 380

Glu Glu Thr Thr Val Gly Gly Tyr Arg Val Pro Gly Gly Thr Met Leu  
385 390 395 400

Leu Val Asn Leu Trp Ala Ile His Asn Asp Pro Lys Leu Trp Asp Glu  
405 410 415

Pro Arg Lys Phe Lys Pro Glu Arg Phe Gln Gly Leu Asp Gly Val Arg  
420 425 430

Asp Gly Tyr Lys Met Met Pro Phe Gly Ser Gly Arg Arg Ser Cys Pro  
435 440 445

Gly Glu Gly Leu Ala Val Arg Met Val Ala Leu Ser Leu Gly Cys Ile  
450 455 460

Ile Gln Cys Phe Asp Trp Gln Arg Ile Gly Glu Glu Leu Val Asp Met  
465 470 475 480

Thr Glu Gly Thr Gly Leu Thr Leu Pro Lys Ala Gln Pro Leu Val Ala  
485 490 495

Lys Cys Ser Pro Arg Pro Lys Met Ala Asn Leu Leu Ser Gln Ile  
500 505 510

<210> 167  
<211> 1675  
<212> DNA  
<213> NICOTIANATABACUM

<400> 167  
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agcttttttac attatcacaa aacatttctt acgcaaactc agaaataacc caccagctcc 120  
atttcttact ttccccttta ttggccatct ttatctcttc aaaaaaccac ttcaacgtac 180

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cttagccaaa atctccgaac gttatggctc tgttcttcta ctcgaattcg gttcacgaaa 240
agtacttttg gtttcttcac catctgcagc tgaagaatgc ttaacaaaaa acgatattat 300
tttcgcgaat cgtcctcttt tgatggctgg aaaacatctt ggatataatt ttacttcttt 360
ggcttggagt tcgtacggag atcactggag aaatcttcgt aggattactt cagttgagat 420
gttttcgact catcgtcttc aaatgctaca tggaattcgt attgatgaag tgaaatctat 480
ggttaagagg ctcaattcct ctgccatagc tgaaaaatct gtggatatga agtctatgtt 540
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gaatgtggag gacattgagg aagctacgag attcaaagggt ttggtgcaag agactttcag 660
gattggcggg gcgacgaata ttggcgactt ttggccggcg ttgaagttat tggtgaggaa 720
attggagaaa agtttaattg tgttgcaaga gaacagagat gagtttatgc aggaattaat 780
taaagattgc agaaaaagaa tggagaaaga aggtactggt actgattcag aaattgaagg 840
gaacaagaaa tgtttaattg aagttttggt aacactacaa gaaaatgaac cggaatacta 900
caaagatgaa atcatcagaa gccttatgct tgttctatta tcagctggta cagatacttc 960
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agcacaagct gaaattgatg aacatatagg acatgaacgt ttagtggacg agtcggacat 1080
caacaacctt ccttacctac gttgtataat caacgagaca ttccgaatgt accctgcagg 1140
accactacta gtcccacacg agtcgtcaga ggaaaccacc gtaggagggt accgtgtacc 1200
cggaggaacc atgttacttg tgaatttggt ggctattcac aatgatccaa agctatggga 1260
tgaaccaaga aagtttaagc cagaaagatt tgaaggacta gaagggtgta gagacggtta 1320
caaaatgatg ctttttggtt ctggacgaag gagttgtcct ggagaaggat tggctattcg 1380
aatggttgca ttgtcattgg gatgtattat tcaatgcttt gattggcaac gacttgggga 1440
aggattgggt gataagactg aagggaactg acttactttg cctaaagctc aacctttagt 1500
ggccaagtgt agcccacgac ctataatggc taatcttctt tctcagattt gaacataatt 1560
ggtttctacc aaacatcccc aaactagaat attattattg gttacatata caatgtaatc 1620
aattttgaac catattatat ctcaatgtat tcctttttta aaaaaaaaaa aaaaaa 1675

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<210> 168
<211> 511
<212> PRT
<213> NICOTIANATABACUM

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<400> 168

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Met Val Asn Met Phe Thr Pro Ile Ile Tyr Ala Pro Leu Leu Leu Ala
1           5           10           15

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Phe Tyr Ile Ile Thr Lys His Phe Leu Arg Lys Leu Arg Asn Asn Pro  
 20 25 30  
 Pro Ala Pro Phe Leu Thr Phe Pro Phe Ile Gly His Leu Tyr Leu Phe  
 35 40 45  
 Lys Lys Pro Leu Gln Arg Thr Leu Ala Lys Ile Ser Glu Arg Tyr Gly  
 50 55 60  
 Ser Val Leu Leu Leu Glu Phe Gly Ser Arg Lys Val Leu Leu Val Ser  
 65 70 75 80  
 Ser Pro Ser Ala Ala Glu Glu Cys Leu Thr Lys Asn Asp Ile Ile Phe  
 85 90 95  
 Ala Asn Arg Pro Leu Leu Met Ala Gly Lys His Leu Gly Tyr Asn Phe  
 100 105 110  
 Thr Ser Leu Ala Trp Ser Ser Tyr Gly Asp His Trp Arg Asn Leu Arg  
 115 120 125  
 Arg Ile Thr Ser Val Glu Met Phe Ser Thr His Arg Leu Gln Met Leu  
 130 135 140  
 His Gly Ile Arg Ile Asp Glu Val Lys Ser Met Val Lys Arg Leu Asn  
 145 150 155 160  
 Ser Ser Ala Ile Ala Glu Lys Ser Val Asp Met Lys Ser Met Phe Phe  
 165 170 175  
 Glu Leu Met Leu Asn Val Met Met Arg Thr Ile Ala Gly Lys Arg Tyr  
 180 185 190  
 Tyr Gly Glu Asn Val Glu Asp Ile Glu Glu Ala Thr Arg Phe Lys Gly  
 195 200 205  
 Leu Val Gln Glu Thr Phe Arg Ile Gly Gly Ala Thr Asn Ile Gly Asp  
 210 215 220  
 Phe Leu Pro Ala Leu Lys Leu Leu Val Arg Lys Leu Glu Lys Ser Leu  
 225 230 235 240  
 Ile Val Leu Gln Glu Asn Arg Asp Glu Phe Met Gln Glu Leu Ile Lys  
 245 250 255  
 Asp Cys Arg Lys Arg Met Glu Lys Glu Gly Thr Val Thr Asp Ser Glu  
 260 265 270

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Ile Glu Gly Asn Lys Lys Cys Leu Ile Glu Val Leu Leu Thr Leu Gln  
275 280 285

Glu Asn Glu Pro Glu Tyr Tyr Lys Asp Glu Ile Ile Arg Ser Leu Met  
290 295 300

Leu Val Leu Leu Ser Ala Gly Thr Asp Thr Ser Val Gly Thr Met Glu  
305 310 315 320

Trp Ala Leu Ser Leu Met Leu Asn His Pro Glu Thr Leu Lys Lys Ala  
325 330 335

Gln Ala Glu Ile Asp Glu His Ile Gly His Glu Arg Leu Val Asp Glu  
340 345 350

Ser Asp Ile Asn Asn Leu Pro Tyr Leu Arg Cys Ile Ile Asn Glu Thr  
355 360 365

Phe Arg Met Tyr Pro Ala Gly Pro Leu Leu Val Pro His Glu Ser Ser  
370 375 380

Glu Glu Thr Thr Val Gly Gly Tyr Arg Val Pro Gly Gly Thr Met Leu  
385 390 395 400

Leu Val Asn Leu Trp Ala Ile His Asn Asp Pro Lys Leu Trp Asp Glu  
405 410 415

Pro Arg Lys Phe Lys Pro Glu Arg Phe Glu Gly Leu Glu Gly Val Arg  
420 425 430

Asp Gly Tyr Lys Met Met Pro Phe Gly Ser Gly Arg Arg Ser Cys Pro  
435 440 445

Gly Glu Gly Leu Ala Ile Arg Met Val Ala Leu Ser Leu Gly Cys Ile  
450 455 460

Ile Gln Cys Phe Asp Trp Gln Arg Leu Gly Glu Gly Leu Val Asp Lys  
465 470 475 480

Thr Glu Gly Thr Gly Leu Thr Leu Pro Lys Ala Gln Pro Leu Val Ala  
485 490 495

Lys Cys Ser Pro Arg Pro Ile Met Ala Asn Leu Leu Ser Gln Ile  
500 505 510

<210> 169  
<211> 1755

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&lt;212&gt; DNA

&lt;213&gt; NICOTIANATABACUM

&lt;400&gt; 169

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taataattat gaaagagatg gtgcaaaaca atatgagcac ttctcttctt gaaactttac	120
aagctacgcc catgatattc tacttcatcg tccctctctt ctgcttattc cttctctcca	180
aatctcgccg taaacgtttg cctccaggtc caactggctg gcctctcatt ggtaacatga	240
tgatgatgga ccagttaact caccgtggcc ttgccaaact agcccaaaaa tatggtggtg	300
tttttcacct taaaatgggt tatgttcaca aaattgtagt ctctgggtcca gacgaagctc	360
gccaaagtatt acaggaacac gacatcatat tttcgaaccg tccagcgacc gtagccataa	420
gttacctaac atatgacagg gcagacatgg cttttgctga ctatggactc ttctggcggc	480
agatgagaaa actatgtgta atgaaactct tcagccgcaa acgagctgag tcatgggact	540
cagttcgaga cgaagcggat tccatgggta gaattgtaac aaccaacaca ggcacagctg	600
ttaacttagg tgaacttggt ttcagttctc ctcgtaatat tatctacaga gctgcttttg	660
gaacttggtc tgaagatgga caaggcgagt tcattaaaat tatgcaagag ttttcgaagc	720
tatttggtgc tttcaatata gctgatttta ttccatggct aggggtgggtt ggtaagcaga	780
gtctaaatat tagacttgct aaggctagag cgctcgcttg tgggttcatt gattcgatta	840
ttgatgacca tattattaga aagaaagctt atgttaatgg caaaaatgat ggaggtgatc	900
gagaaactga tatggtggat gagcttttag ctttttacag tgaggaagca aaagtaactg	960
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agcttatgag gagtcctgaa gatcttaaaa aggtacaaca agagctggct aacgttggtg	1140
gactcaacag aaaagttgaa gaatctgact ttgaaaaatt aacatactta agatgttgct	1200
taaaagaaac tctacgactt caccctccaa tccctctcct cctccatgag accgccgagg	1260
aatccaccgt ctccggctac catattccgg caaagtcaca tgttattata aattcatttg	1320
ccattgggcg tgacaaaaat tcatgggaag atcctgaaac ttataaacca tctaggtttc	1380
tcaaagaagg tgtaccagat tttaaaggag gtaattttga gtttatacca tttgggtcgg	1440
gtcggcggtc ttgccccggt atgcaacttg ggctttatgc attggaaatg gctgtggccc	1500
atcttcttca ttgttttact tgggaattgc cagatggtat gaaaccaagt gagcttaaaa	1560
tggatgatat ttttggactc actgctccaa gagctaatacg actcgtggct gtgcctactc	1620
cacgtttggt gtgtcccctt tattaattga agaaaaaagg tggggctttt acttgcacat	1680
aagagtgggtg cttgtgattt ttccaccttt tgggttaaata tacgaattat tatgatatac	1740
gaattcttgg gcaca	1755

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<210> 170  
 <211> 525  
 <212> PRT  
 <213> NICOTIANATABACUM

<400> 170

Met Lys Glu Met Val Gln Asn Asn Met Ser Thr Ser Leu Leu Glu Thr  
 1 5 10 15

Leu Gln Ala Thr Pro Met Ile Phe Tyr Phe Ile Val Pro Leu Phe Cys  
 20 25 30

Leu Phe Leu Leu Ser Lys Ser Arg Arg Lys Arg Leu Pro Pro Gly Pro  
 35 40 45

Thr Gly Trp Pro Leu Ile Gly Asn Met Met Met Met Asp Gln Leu Thr  
 50 55 60

His Arg Gly Leu Ala Lys Leu Ala Gln Lys Tyr Gly Gly Val Phe His  
 65 70 75 80

Leu Lys Met Gly Tyr Val His Lys Ile Val Val Ser Gly Pro Asp Glu  
 85 90 95

Ala Arg Gln Val Leu Gln Glu His Asp Ile Ile Phe Ser Asn Arg Pro  
 100 105 110

Ala Thr Val Ala Ile Ser Tyr Leu Thr Tyr Asp Arg Ala Asp Met Ala  
 115 120 125

Phe Ala Asp Tyr Gly Leu Phe Trp Arg Gln Met Arg Lys Leu Cys Val  
 130 135 140

Met Lys Leu Phe Ser Arg Lys Arg Ala Glu Ser Trp Asp Ser Val Arg  
 145 150 155 160

Asp Glu Ala Asp Ser Met Val Arg Ile Val Thr Thr Asn Thr Gly Thr  
 165 170 175

Ala Val Asn Leu Gly Glu Leu Val Phe Ser Leu Thr Arg Asn Ile Ile  
 180 185 190

Tyr Arg Ala Ala Phe Gly Thr Cys Ser Glu Asp Gly Gln Gly Glu Phe  
 195 200 205

Ile Lys Ile Met Gln Glu Phe Ser Lys Leu Phe Gly Ala Phe Asn Ile  
 210 215 220



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Ala Asp Phe Ile Pro Trp Leu Gly Trp Val Gly Lys Gln Ser Leu Asn  
225 230 235 240

Ile Arg Leu Ala Lys Ala Arg Ala Ser Leu Asp Gly Phe Ile Asp Ser  
245 250 255

Ile Ile Asp Asp His Ile Ile Arg Lys Lys Ala Tyr Val Asn Gly Lys  
260 265 270

Asn Asp Gly Gly Asp Arg Glu Thr Asp Met Val Asp Glu Leu Leu Ala  
275 280 285

Phe Tyr Ser Glu Glu Ala Lys Val Thr Glu Ser Glu Asp Leu Gln Asn  
290 295 300

Ala Ile Arg Leu Thr Lys Asp Asn Ile Lys Ala Ile Ile Met Asp Val  
305 310 315 320

Met Phe Gly Gly Thr Glu Thr Val Ala Ser Ala Ile Glu Trp Ala Met  
325 330 335

Ala Glu Leu Met Arg Ser Pro Glu Asp Leu Lys Lys Val Gln Gln Glu  
340 345 350

Leu Ala Asn Val Val Gly Leu Asn Arg Lys Val Glu Glu Ser Asp Phe  
355 360 365

Glu Lys Leu Thr Tyr Leu Arg Cys Cys Leu Lys Glu Thr Leu Arg Leu  
370 375 380

His Pro Pro Ile Pro Leu Leu Leu His Glu Thr Ala Glu Glu Ser Thr  
385 390 395 400

Val Ser Gly Tyr His Ile Pro Ala Lys Ser His Val Ile Ile Asn Ser  
405 410 415

Phe Ala Ile Gly Arg Asp Lys Asn Ser Trp Glu Asp Pro Glu Thr Tyr  
420 425 430

Lys Pro Ser Arg Phe Leu Lys Glu Gly Val Pro Asp Phe Lys Gly Gly  
435 440 445

Asn Phe Glu Phe Ile Pro Phe Gly Ser Gly Arg Arg Ser Cys Pro Gly  
450 455 460

Met Gln Leu Gly Leu Tyr Ala Leu Glu Met Ala Val Ala His Leu Leu  
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465

470

475

480

His Cys Phe Thr Trp Glu Leu Pro Asp Gly Met Lys Pro Ser Glu Leu  
 485 490 495

Lys Met Asp Asp Ile Phe Gly Leu Thr Ala Pro Arg Ala Asn Arg Leu  
 500 505 510

Val Ala Val Pro Thr Pro Arg Leu Leu Cys Pro Leu Tyr  
 515 520 525

<210> 171  
 <211> 1684  
 <212> DNA  
 <213> NICOTIANATABACUM

<400> 171  
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 ttgcaatttc ttcatcttgc attatctttg tactaagatg ggcatggaaa atcttgaatt 120  
 atgtgtgggt aaaacaaaa gaattggaga aatacctcag acagcagggt ttcaaaggaa 180  
 actcttaca attcttgttt ggggatatga aagagatgaa gaaaatgggt gaagaagcta 240  
 tgtctaagcc aatcaatttc tctcatgaca tgatttggcc tagagttagt ccattcatcc 300  
 acaaaaccat caccaattat ggtaagaatt gtattgtgtg gtttgggcca agaccagcag 360  
 tcctgatcac agacccggaa cttgtaaaagg aggtgctaac gaagaatttc gtctatcaga 420  
 agccgcttgg caatccactc acaaagttgg cagcaactgg aattgcaggc tatgaaacag 480  
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 tttcacaaa cggaacagag atagatgtgt ggccatattt acaaactttg acaagtgatg 660  
 ccatttcaag aactgcgttt ggaagtagtt atgaagaagg aagaaagatt tttgaccttc 720  
 aaaaagaaca actttcacta attctagaag tttcacgcac aatatatatt ccaggatgga 780  
 ggtttttgcc aacgaaaagg aacaaaagga tgaagcaaat atttaatgaa gtacgagcac 840  
 tggatatttg aattattaag aaaaggatga gtatgattga aaatggagaa gcacctgatg 900  
 atttattggg aatattattg gcatccaatt taaaagaaat ccaacaacat ggaaacaaca 960  
 agaaatttgg tatgagtatt gatgaggtga ttgaagagtg taaactcttc tattttgctg 1020  
 ggcaagagac tacttcatct ttacttgtat ggactatgat tttgttgtgc aaatatccta 1080  
 attggcaaga taaagctaga gaagaggttt tgcaagtgtt tgggagtagg gaagttgact 1140  
 atgacaagtt gaatcagcta aaaatagtaa ctatgatctt aaacgaggtc ttaaggttgt 1200  
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## 79601-7270 Sequence Listing v2 -03-25-04.ST25

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caacaaaagg aaaacttgtg ttttttccat ttagttgggg tccaagaata tgtattgggc 1440
aaaattttgc tatgttagag gctaaaatgg caatggctat gattctgaaa acctatgcat 1500
ttgaactctc tccatcttat gctcatgctc ctcatccact actacttcaa cctcaatatg 1560
gtgctcaatt aattttgtac aagttgtaga tatgggtcaat ttggaacttg ttatggaact 1620
tttatcattg taatcaacca tattgaggga acatgggttg aggttaaata ctcgtgtgtg 1680
tgtc 1684

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<210> 172
<211> 518
<212> PRT
<213> NICOTIANATABACUM

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<400> 172

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Met Glu Ile Pro Tyr Tyr Ser Leu Lys Ile Ala Ile Ser Ser Phe Ala
1 5 10 15

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Ile Ile Phe Val Leu Arg Trp Ala Trp Lys Ile Leu Asn Tyr Val Trp
20 25 30

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Leu Lys Pro Lys Glu Leu Glu Lys Tyr Leu Arg Gln Gln Gly Phe Lys
35 40 45

```

```

Gly Asn Ser Tyr Lys Phe Leu Phe Gly Asp Met Lys Glu Met Lys Lys
50 55 60

```

```

Met Gly Glu Glu Ala Met Ser Lys Pro Ile Asn Phe Ser His Asp Met
65 70 75 80

```

```

Ile Trp Pro Arg Val Met Pro Phe Ile His Lys Thr Ile Thr Asn Tyr
85 90 95

```

```

Gly Lys Asn Cys Ile Val Trp Phe Gly Pro Arg Pro Ala Val Leu Ile
100 105 110

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Thr Asp Pro Glu Leu Val Lys Glu Val Leu Thr Lys Asn Phe Val Tyr
115 120 125

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```

Gln Lys Pro Leu Gly Asn Pro Leu Thr Lys Leu Ala Ala Thr Gly Ile
130 135 140

```

```

Ala Gly Tyr Glu Thr Asp Lys Trp Ala Thr His Arg Arg Leu Leu Asn
145 150 155 160

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Pro Ala Phe His Leu Asp Lys Leu Lys His Met Leu Pro Ala Phe Gln  
165 170 175

Phe Thr Ala Ser Glu Met Leu Ser Lys Leu Glu Lys Val Val Ser Pro  
180 185 190

Asn Gly Thr Glu Ile Asp Val Trp Pro Tyr Leu Gln Thr Leu Thr Ser  
195 200 205

Asp Ala Ile Ser Arg Thr Ala Phe Gly Ser Ser Tyr Glu Glu Gly Arg  
210 215 220

Lys Ile Phe Asp Leu Gln Lys Glu Gln Leu Ser Leu Ile Leu Glu Val  
225 230 235 240

Ser Arg Thr Ile Tyr Ile Pro Gly Trp Arg Phe Leu Pro Thr Lys Arg  
245 250 255

Asn Lys Arg Met Lys Gln Ile Phe Asn Glu Val Arg Ala Leu Val Phe  
260 265 270

Gly Ile Ile Lys Lys Arg Met Ser Met Ile Glu Asn Gly Glu Ala Pro  
275 280 285

Asp Asp Leu Leu Gly Ile Leu Leu Ala Ser Asn Leu Lys Glu Ile Gln  
290 295 300

Gln His Gly Asn Asn Lys Lys Phe Gly Met Ser Ile Asp Glu Val Ile  
305 310 315 320

Glu Glu Cys Lys Leu Phe Tyr Phe Ala Gly Gln Glu Thr Thr Ser Ser  
325 330 335

Leu Leu Val Trp Thr Met Ile Leu Leu Cys Lys Tyr Pro Asn Trp Gln  
340 345 350

Asp Lys Ala Arg Glu Glu Val Leu Gln Val Phe Gly Ser Arg Glu Val  
355 360 365

Asp Tyr Asp Lys Leu Asn Gln Leu Lys Ile Val Thr Met Ile Leu Asn  
370 375 380

Glu Val Leu Arg Leu Tyr Pro Ala Gly Tyr Val Ile Asn Arg Met Val  
385 390 395 400

Asn Lys Glu Thr Lys Leu Gly Asn Leu Cys Leu Pro Ala Gly Val Gln  
405 410 415

79601-7270 Sequence Listing v2 -03-25-04.ST25

Leu Val Leu Pro Thr Met Leu Leu Gln His Asp Thr Glu Ile Trp Gly  
420 425 430

Asp Asp Ala Met Glu Phe Asn Pro Glu Arg Phe Ser Asp Gly Ile Ser  
435 440 445

Lys Ala Thr Lys Gly Lys Leu Val Phe Phe Pro Phe Ser Trp Gly Pro  
450 455 460

Arg Ile Cys Ile Gly Gln Asn Phe Ala Met Leu Glu Ala Lys Met Ala  
465 470 475 480

Met Ala Met Ile Leu Lys Thr Tyr Ala Phe Glu Leu Ser Pro Ser Tyr  
485 490 495

Ala His Ala Pro His Pro Leu Leu Leu Gln Pro Gln Tyr Gly Ala Gln  
500 505 510

Leu Ile Leu Tyr Lys Leu  
515

<210> 173  
<211> 1697  
<212> DNA  
<213> NICOTIANATABACUM

<400> 173  
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aaaaccatgg cctattgttg gcaatataca tcttcttggt tccaccctc acagatccct 180  
tcacgaactt gcaaaaagat acggagattt aatgctacta aagttcgggt cgcgcaatgt 240  
ccttatttta tcctccccag atatggctag agaattcttg aaaacaaatg atgccatttg 300  
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atgggcacgt tatggaccct ttgggagaca agcaaggagg atctatctca acgagatttt 420  
caatcctaaa cgtttggtt catttgagta cattcgcata gaggaaaggc ataatttgat 480  
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cactcttaca agtataagta gaacagtatt gagtggaaaa tatttttagcg agtcacctgg 600  
ccaaaattca atgataactt tgaaacaatt gcaggatatg cttgataagt ggtttttgct 660  
taatgggtgtg atcaatattg gggactggat accttggtt gctttcttggt atttgcaggg 720  
ttatgtcaag caaatgaagg agttgcatag gaacttcgac aaatttcata actttgtgct 780  
agatgatcac aaggctaata ggggagagaa gaactttgtg ccaagagaca tggtcgatgt 840

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tttgctgcag caagctgagg atcctaattct tgagggtcaaa ctcaccaatg attgtgtcaa    900
gggtcctaattg caggacttat tggctggcg caccggacacc tcagcaacaa ccgttgaattg    960
ggcttttttat gaactttctta gacaacctaa gattatgaag aaagcacaac aagagctaga    1020
ccttgtcatt tcacaggaca gatgggttca agaaaaagat tacactcaac tcccttacat    1080
tgagtcaatc atcaaggaaa cattgaggct tcacccagta agcaccatgc ttccaccgcg    1140
cattgccttg gaggattgtc atgtagcagg ctatgacata cctaaaggta caattttaat    1200
tgtgaacact tggagtattg gaagaaattc acagcattgg gagtcaccag aagaattcct    1260
tccggagagg tttgaaggga agaattattg tgtcacagga caacattttg cgctcttgcc    1320
atttggcgcg ggccggagaa agtgcccagg atacagtctt gggattcgta taattagggc    1380
aacttttagct aacttggttc atggattcaa ctggagattg cctaattgga tgagtccaga    1440
agacattagc atggaagaga tttatgggct aattacacac cccaaagtcg cacttgacgt    1500
gatgatggag cctcgacttc ccaaccatct ttacaaatag tggataatta aaaccattaa    1560
aatcgttttg ttatatgcat gtctcatatt tgtagtggtc aaaatgtttg ttttctatca    1620
tggatgttca gtgcgagggtt gggaatttca agtcattaac gtgtgaaaat attttaaatt    1680
taaaaaaaaa aaaaaaa                                1697

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<210> 174  
 <211> 508  
 <212> PRT  
 <213> NICOTIANATABACUM

<400> 174

Met Glu Asn Ser Trp Val Val Leu Ala Leu Thr Gly Leu Leu Thr Leu  
 1 5 10 15

Val Phe Leu Ser Lys Phe Leu His Ser Pro Arg Arg Lys Gln Asn Leu  
 20 25 30

Pro Pro Gly Pro Lys Pro Trp Pro Ile Val Gly Asn Ile His Leu Leu  
 35 40 45

Gly Ser Thr Pro His Arg Ser Leu His Glu Leu Ala Lys Arg Tyr Gly  
 50 55 60

Asp Leu Met Leu Leu Lys Phe Gly Ser Arg Asn Val Leu Ile Leu Ser  
 65 70 75 80

Ser Pro Asp Met Ala Arg Glu Phe Leu Lys Thr Asn Asp Ala Ile Trp  
 85 90 95

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Ala Ser Arg Pro Glu Leu Ala Ala Gly Lys Tyr Thr Ala Tyr Asn Tyr  
100 105 110

Cys Asp Met Thr Trp Ala Arg Tyr Gly Pro Phe Trp Arg Gln Ala Arg  
115 120 125

Arg Ile Tyr Leu Asn Glu Ile Phe Asn Pro Lys Arg Leu Asp Ser Phe  
130 135 140

Glu Tyr Ile Arg Ile Glu Glu Arg His Asn Leu Ile Ser Arg Leu Phe  
145 150 155 160

Val Leu Ser Gly Lys Pro Ile Leu Leu Arg Asp His Leu Thr Arg Tyr  
165 170 175

Thr Leu Thr Ser Ile Ser Arg Thr Val Leu Ser Gly Lys Tyr Phe Ser  
180 185 190

Glu Ser Pro Gly Gln Asn Ser Met Ile Thr Leu Lys Gln Leu Gln Asp  
195 200 205

Met Leu Asp Lys Trp Phe Leu Leu Asn Gly Val Ile Asn Ile Gly Asp  
210 215 220

Trp Ile Pro Trp Leu Ala Phe Leu Asp Leu Gln Gly Tyr Val Lys Gln  
225 230 235 240

Met Lys Glu Leu His Arg Asn Phe Asp Lys Phe His Asn Phe Val Leu  
245 250 255

Asp Asp His Lys Ala Asn Arg Gly Glu Lys Asn Phe Val Pro Arg Asp  
260 265 270

Met Val Asp Val Leu Leu Gln Gln Ala Glu Asp Pro Asn Leu Glu Val  
275 280 285

Lys Leu Thr Asn Asp Cys Val Lys Gly Leu Met Gln Asp Leu Leu Ala  
290 295 300

Gly Gly Thr Asp Thr Ser Ala Thr Thr Val Glu Trp Ala Phe Tyr Glu  
305 310 315 320

Leu Leu Arg Gln Pro Lys Ile Met Lys Lys Ala Gln Gln Glu Leu Asp  
325 330 335

Leu Val Ile Ser Gln Asp Arg Trp Val Gln Glu Lys Asp Tyr Thr Gln  
340 345 350

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Leu Pro Tyr Ile Glu Ser Ile Ile Lys Glu Thr Leu Arg Leu His Pro  
355 360 365

Val Ser Thr Met Leu Pro Pro Arg Ile Ala Leu Glu Asp Cys His Val  
370 375 380

Ala Gly Tyr Asp Ile Pro Lys Gly Thr Ile Leu Ile Val Asn Thr Trp  
385 390 395 400

Ser Ile Gly Arg Asn Ser Gln His Trp Glu Ser Pro Glu Glu Phe Leu  
405 410 415

Pro Glu Arg Phe Glu Gly Lys Asn Ile Gly Val Thr Gly Gln His Phe  
420 425 430

Ala Leu Leu Pro Phe Gly Ala Gly Arg Arg Lys Cys Pro Gly Tyr Ser  
435 440 445

Leu Gly Ile Arg Ile Ile Arg Ala Thr Leu Ala Asn Leu Leu His Gly  
450 455 460

Phe Asn Trp Arg Leu Pro Asn Gly Met Ser Pro Glu Asp Ile Ser Met  
465 470 475 480

Glu Glu Ile Tyr Gly Leu Ile Thr His Pro Lys Val Ala Leu Asp Val  
485 490 495

Met Met Glu Pro Arg Leu Pro Asn His Leu Tyr Lys  
500 505

<210> 175  
<211> 1631  
<212> DNA  
<213> NICOTIANATABACUM

<400> 175  
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atatggagag tgctgaattg ggtttggttc agaccaaaga agctggaaaa gctactgagg 120  
aaacaaggctc tcaaaggcaa ttcttacagg attttgtatg gggatatgaa ggagctttct 180  
ggatatgatta aggaagctaa ctccaaaccc atgaatcttt ctgatgatat tgccccaaga 240  
ttgggtccctt tctttcttga taccatcaag aaatatggga aaaaatcctt tgtatggttg 300  
ggtcctcaaac cgctgggtttt tgtcatggac cccgagctta taaaggaagt attctccaaa 360  
aactatctgt atcaaaagcc tcattcaaat ccattaacca agttactggc acaaggactt 420  
gtaagccaag aggaagacaa atgggccaaa catagaaaaa tcgtcactcc tgccttccac 480



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ctggagaagc taaagcatat gcttccagct tttgtttga gctgtactga gatgctgagc 540
aaatgggaag acattgttgc agttgagggc tcacatgaga tagatatatg gcctggcctt 600
caacaattaa ctagtgatgt gatctctcgg acagcctttg gcagtagcta tgaagcaggt 660
agaaggatat ttgaacttca aaaggaacaa gctcaatttc ttatggaagc tatacgctcc 720
gtttatattc caggctggag gtttttgcca acaaagagga acagaagaat gaaggaaatt 780
gaaaaggatg ttcaagcctt agttagaggt attattgata aaagagtaaa gtcaatgaaa 840
gcaggagagg tgaataatga ggatctgctt ggtatattgc tggaatctaa ttttaaagaa 900
attgaacagc atggaaacaa ggatttttga atgagcattg aagaagtcac tcaagaatgc 960
aagttattct attttgctgg ccaagaaact acatcagtgt tgcttgtatg gactctaata 1020
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tacgagtctt taaggctcta tccccagta gtgacactta cccgaaggcc taaggaagac 1200
actgtattag gagatgtatc tctaccagca ggtgtgttaa tctccttacc agtgatctta 1260
ttgcatcacg acgaagagat atggggtaaa gatgcaaaga agttcaagcc agagagattc 1320
agagatggag tctcaagtgc aacaaaggtt caagtcactt ttttcccatt tacttggggg 1380
cccagaatat gcattggaca aaattttgcc atgttagaag caaagactac tttggctatg 1440
atcctacaac gcttctcctt tgaactgtct ccatcttatg cacatgctcc tcagtccata 1500
ataactttgc aaccccagta tgggtgctcca cttattttgc ataaaaatata gtttattact 1560
tgtaagtagt gtctcgtttt atgttaagca tgagtccaaa atgttaaggc ttgtagaact 1620
gcaaaatggg a 1631

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<210> 176  
 <211> 461  
 <212> PRT  
 <213> NICOTIANATABACUM

<400> 176

Met Lys Glu Leu Ser Gly Met Ile Lys Glu Ala Asn Ser Lys Pro Met  
 1 5 10 15

Asn Leu Ser Asp Asp Ile Ala Pro Arg Leu Val Pro Phe Phe Leu Asp  
 20 25 30

Thr Ile Lys Lys Tyr Gly Lys Lys Ser Phe Val Trp Leu Gly Pro Lys  
 35 40 45

Pro Leu Val Phe Val Met Asp Pro Glu Leu Ile Lys Glu Val Phe Ser  
 50 55 60

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Lys Asn Tyr Leu Tyr Gln Lys Pro His Ser Asn Pro Leu Thr Lys Leu  
 65 70 75 80  
 Leu Ala Gln Gly Leu Val Ser Gln Glu Glu Asp Lys Trp Ala Lys His  
 85 90 95  
 Arg Lys Ile Val Thr Pro Ala Phe His Leu Glu Lys Leu Lys His Met  
 100 105 110  
 Leu Pro Ala Phe Cys Leu Ser Cys Thr Glu Met Leu Ser Lys Trp Glu  
 115 120 125  
 Asp Ile Val Ala Val Glu Gly Ser His Glu Ile Asp Ile Trp Pro Gly  
 130 135 140  
 Leu Gln Gln Leu Thr Ser Asp Val Ile Ser Arg Thr Ala Phe Gly Ser  
 145 150 155 160  
 Ser Tyr Glu Ala Gly Arg Arg Ile Phe Glu Leu Gln Lys Glu Gln Ala  
 165 170 175  
 Gln Phe Leu Met Glu Ala Ile Arg Ser Val Tyr Ile Pro Gly Trp Arg  
 180 185 190  
 Phe Leu Pro Thr Lys Arg Asn Arg Arg Met Lys Glu Ile Glu Lys Asp  
 195 200 205  
 Val Gln Ala Leu Val Arg Gly Ile Ile Asp Lys Arg Val Lys Ser Met  
 210 215 220  
 Lys Ala Gly Glu Val Asn Asn Glu Asp Leu Leu Gly Ile Leu Leu Glu  
 225 230 235 240  
 Ser Asn Phe Lys Glu Ile Glu Gln His Gly Asn Lys Asp Phe Gly Met  
 245 250 255  
 Ser Ile Glu Glu Val Ile Gln Glu Cys Lys Leu Phe Tyr Phe Ala Gly  
 260 265 270  
 Gln Glu Thr Thr Ser Val Leu Leu Val Trp Thr Leu Ile Leu Leu Ser  
 275 280 285  
 Arg His Gln Asp Trp Gln Ala Leu Ala Arg Glu Glu Val Leu Gln Val  
 290 295 300  
 Phe Gly Asn Gln Lys Pro Asp Phe Asp Gly Leu Asn Arg Leu Lys Ile  
 305 310 315 320

## 79601-7270 Sequence Listing v2 -03-25-04.ST25

Val Thr Met Ile Leu Tyr Glu Ser Leu Arg Leu Tyr Pro Pro Val Val  
325 330 335

Thr Leu Thr Arg Arg Pro Lys Glu Asp Thr Val Leu Gly Asp Val Ser  
340 345 350

Leu Pro Ala Gly Val Leu Ile Ser Leu Pro Val Ile Leu Leu His His  
355 360 365

Asp Glu Glu Ile Trp Gly Lys Asp Ala Lys Lys Phe Lys Pro Glu Arg  
370 375 380

Phe Arg Asp Gly Val Ser Ser Ala Thr Lys Gly Gln Val Thr Phe Phe  
385 390 395 400

Pro Phe Thr Trp Gly Pro Arg Ile Cys Ile Gly Gln Asn Phe Ala Met  
405 410 415

Leu Glu Ala Lys Thr Thr Leu Ala Met Ile Leu Gln Arg Phe Ser Phe  
420 425 430

Glu Leu Ser Pro Ser Tyr Ala His Ala Pro Gln Ser Ile Ile Thr Leu  
435 440 445

Gln Pro Gln Tyr Gly Ala Pro Leu Ile Leu His Lys Ile  
450 455 460

<210> 177

<211> 1572

<212> DNA

<213> NICOTIANATABACUM

<400> 177

atttatctct gaaaaatgcaa ttcttcagct tggtttccat tttcctattc ctatctttcc	60
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catggaaaat accaatacta ggaagtatgc ttcatatgat tgggtggagaa ccgcaccatg	180
tccttagaga tttagccaaa aaagatggac cacttatgca ctttcagtta ggtgaaattt	240
ctgcagttgt ggttacttct agggacatgg caaaagaagt gctaaaaact catgacgtcg	300
tttttgcatt taggcctaaa attgtagcca tggacattat ctgttataac cagtccgaca	360
ttgccttttag cccttatggc gaccactgga gacaaatgcg taaaatttgt gtcattggaac	420
ttctcaatgc aaagaatggt cggtctttca gctccatcag acgtgatgaa gtcgttcgtc	480
tcattgactc tatccggtca gattcttctt caggtgagct agttaatttt acgcagagga	540
tcatttggtt tgcaagctcc atgacgtgta gatcagcatt tgggcaagta ctcaaggggc	600

79601-7270 Sequence Listing v2 -03-25-04.ST25

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aagacatatt tgccaaaaag atcagagaag taataggatt agcagaaggc tttgatgtgg 660
tagacatctt ccctacatac aagtttcttc atgttctcag tgggatgaag cgtaaacttt 720
tgaatgccc ccttaaggta gacgccattg ttgaggatgt catcaacgag cacaagaaaa 780
atcttgcagc tggcaagagt aatggcgcat taggaggcga agatctaatt gatgtcctac 840
tgagacttat gaatgacaca agtcttcaat ttcccatcac caacgacaat atcaaagctg 900
ttgttgttga catgtttgct gccggaacag aaacttcac aacaacaact gtatgggcca 960
tggctgaaat gatgaagaat ccaagtgtat tcgccaaagc tcaagcagaa gtgcgagaag 1020
cctttagggg caaagtatct tttgatgaaa atgatgtgga ggagctgaaa tacttaaagt 1080
tagtcattaa agaaactttg agacttcac caccgtctcc acttttggtc ccaagagaat 1140
gcagggaaga tacggatata aacggctaca ctattcctgc aaagaccaa gttatggtta 1200
atgtttgggc attgggaaga gatccaaaat attgggatga cgcggaagc ttttaagccag 1260
agagatttga gcaatgttct gtagatattt ttggtaataa ttttgagttt cttccctttg 1320
gcgggggacg gagaatttgt cctggaatgt catttggttt agctaattct tacttaccat 1380
tggctcaatt actctatcac tttgactgga aactcccaac cggaatcaag ccaagagact 1440
tggacttgac cgaattatcg ggaataacta ttgctagaaa gggtgacctt tacttaaagt 1500
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ttcatcaacc tc 1572

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<210> 178  
 <211> 504  
 <212> PRT  
 <213> NICOTIANATABACUM

<400> 178

Met Gln Phe Phe Ser Leu Val Ser Ile Phe Leu Phe Leu Ser Phe Leu  
 1 5 10 15

Phe Leu Leu Arg Lys Trp Lys Asn Ser Asn Ser Gln Ser Lys Lys Leu  
 20 25 30

Pro Pro Gly Pro Trp Lys Ile Pro Ile Leu Gly Ser Met Leu His Met  
 35 40 45

Ile Gly Gly Glu Pro His His Val Leu Arg Asp Leu Ala Lys Lys Asp  
 50 55 60

Gly Pro Leu Met His Leu Gln Leu Gly Glu Ile Ser Ala Val Val Val  
 65 70 75 80

## 79601-7270 Sequence Listing v2 -03-25-04.ST25

Thr Ser Arg Asp Met Ala Lys Glu Val Leu Lys Thr His Asp Val Val  
 85 90 95  
 Phe Ala Ser Arg Pro Lys Ile Val Ala Met Asp Ile Ile Cys Tyr Asn  
 100 105 110  
 Gln Ser Asp Ile Ala Phe Ser Pro Tyr Gly Asp His Trp Arg Gln Met  
 115 120 125  
 Arg Lys Ile Cys Val Met Glu Leu Leu Asn Ala Lys Asn Val Arg Ser  
 130 135 140  
 Phe Ser Ser Ile Arg Arg Asp Glu Val Val Arg Leu Ile Asp Ser Ile  
 145 150 155 160  
 Arg Ser Asp Ser Ser Ser Gly Glu Leu Val Asn Phe Thr Gln Arg Ile  
 165 170 175  
 Ile Trp Phe Ala Ser Ser Met Thr Cys Arg Ser Ala Phe Gly Gln Val  
 180 185 190  
 Leu Lys Gly Gln Asp Ile Phe Ala Lys Lys Ile Arg Glu Val Ile Gly  
 195 200 205  
 Leu Ala Glu Gly Phe Asp Val Val Asp Ile Phe Pro Thr Tyr Lys Phe  
 210 215 220  
 Leu His Val Leu Ser Gly Met Lys Arg Lys Leu Leu Asn Ala His Leu  
 225 230 235 240  
 Lys Val Asp Ala Ile Val Glu Asp Val Ile Asn Glu His Lys Lys Asn  
 245 250 255  
 Leu Ala Ala Gly Lys Ser Asn Gly Ala Leu Gly Gly Glu Asp Leu Ile  
 260 265 270  
 Asp Val Leu Leu Arg Leu Met Asn Asp Thr Ser Leu Gln Phe Pro Ile  
 275 280 285  
 Thr Asn Asp Asn Ile Lys Ala Val Val Val Asp Met Phe Ala Ala Gly  
 290 295 300  
 Thr Glu Thr Ser Ser Thr Thr Thr Val Trp Ala Met Ala Glu Met Met  
 305 310 315 320  
 Lys Asn Pro Ser Val Phe Ala Lys Ala Gln Ala Glu Val Arg Glu Ala  
 325 330 335

79601-7270 Sequence Listing v2 -03-25-04.ST25

Phe Arg Asp Lys Val Ser Phe Asp Glu Asn Asp Val Glu Glu Leu Lys  
340 345 350

Tyr Leu Lys Leu Val Ile Lys Glu Thr Leu Arg Leu His Pro Pro Ser  
355 360 365

Pro Leu Leu Val Pro Arg Glu Cys Arg Glu Asp Thr Asp Ile Asn Gly  
370 375 380

Tyr Thr Ile Pro Ala Lys Thr Lys Val Met Val Asn Val Trp Ala Leu  
385 390 395 400

Gly Arg Asp Pro Lys Tyr Trp Asp Asp Ala Glu Ser Phe Lys Pro Glu  
405 410 415

Arg Phe Glu Gln Cys Ser Val Asp Ile Phe Gly Asn Asn Phe Glu Phe  
420 425 430

Leu Pro Phe Gly Gly Gly Arg Arg Ile Cys Pro Gly Met Ser Phe Gly  
435 440 445

Leu Ala Asn Leu Tyr Leu Pro Leu Ala Gln Leu Leu Tyr His Phe Asp  
450 455 460

Trp Lys Leu Pro Thr Gly Ile Lys Pro Arg Asp Leu Asp Leu Thr Glu  
465 470 475 480

Leu Ser Gly Ile Thr Ile Ala Arg Lys Gly Asp Leu Tyr Leu Asn Ala  
485 490 495

Thr Pro Tyr Gln Pro Ser Arg Glu  
500

<210> 179  
<211> 1633  
<212> DNA  
<213> NICOTIANATABACUM

<400> 179  
ataatgcttt ctcccataga agccattgta ggactagtaa ccttcacatt tctcttcttc 60  
ttcctatgga caaaaaaatc tcaaaaacct tcaaaaccct taccaccgaa aatccccgga 120  
ggatggccgg taatcgcca tcttttccac ttcaatgacg acggcgacga ccgtccatta 180  
gctcgaaaac tcggagactt agctgacaaa tacggccccg ttttacttt tcggctaggc 240  
cttccccttg tcttagttgt aagcagttac gaagctgtaa aagactgttt ctctacaaat 300  
gacgccattt tttccaatcg tccagctttt ctttacggcg attaccttgg ctacaataat 360

## 79601-7270 Sequence Listing v2 -03-25-04.ST25

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gccatgctat ttttggccaa ttacggacct tactggcgaa aaaatcgaaa attagttatt 420
caggaagttc tctccgctag tcgtctcgaa aaattcaaac acgtgagatt tgcaagaatt 480
caagcgagca ttaagaattt atatactcga attgatggaa attcgagtac gataaattta 540
actgattggt tagaagaatt gaatttttggc ctgatcgtga agatgatcgc tggaaaaaat 600
tatgaatccg gtaaaggaga tgaacaagtg gagagattta agaaagcgtt taaggatttt 660
atgattttat caatggagtt tgtgttatgg gatgcatttc caattccatt atttaaatgg 720
gtggattttc aagggcatgt taaggctatg aaaaggactt ttaaagatat agattctgtt 780
tttcagaatt ggtagggga acatattaat aaaagagaaa aaatggaggt taatgcagaa 840
gggaatgaac aagatttcat tgatgtggtg ctttcaaaaa tgagtaatga atatcttggg 900
gaaggttact ctcgtgatac tgtcattaaa gcaacggtgt ttagtttggt cttggatgca 960
gcagacacag ttgctcttca cataaattgg ggaatggcat tattgataaa caatcaaaag 1020
gccttgacga aagcacaaga agagatagac acaaaagttg gtaaggacag atgggtagaa 1080
gagagtgata ttaaggattt ggtatacctc caagctattg ttaaagaagt gttacgatta 1140
tatccaccag gacctttgtt agtaccacac gaaaatgtag aagattgtgt tgttagtgga 1200
tatcacattc cttaaaggac aagattattc gcaaacgtca tgaaactgct acgtgatcct 1260
aaactctggc ctgatcctga tactttcgat ccagagagat tcattgctac tgatattgac 1320
tttcgtggtc agtactataa gtatatcccg tttggttctg gaagacgatc ttgtccaggg 1380
atgacttatg cattgcaagt ggaacactta acaatggcac atttgatcca aggtttcaat 1440
tacagaactc caaatgacga gcccttggat atgaaggaag gtgcaggcat aactatacgt 1500
aaggtaaadc ctgtggaact gataatagcg cctcgcctgg cacctgagct ttattaaaac 1560
ctaagatctt tcattcttgg tgatcattgt ataatactcc taaatggata ttcatttacc 1620
ttttatcaat taa 1633

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&lt;210&gt; 180

&lt;211&gt; 517

&lt;212&gt; PRT

&lt;213&gt; NICOTIANATABACUM

&lt;400&gt; 180

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Met Leu Ser Pro Ile Glu Ala Ile Val Gly Leu Val Thr Phe Thr Phe
1           5           10          15

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Leu Phe Phe Phe Leu Trp Thr Lys Lys Ser Gln Lys Pro Ser Lys Pro
          20          25          30

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Leu Pro Pro Lys Ile Pro Gly Gly Trp Pro Val Ile Gly His Leu Phe
          35          40          45

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## 79601-7270 Sequence Listing v2 -03-25-04.ST25

His Phe Asn Asp Asp Gly Asp Asp Arg Pro Leu Ala Arg Lys Leu Gly  
 50 55 60  
 Asp Leu Ala Asp Lys Tyr Gly Pro Val Phe Thr Phe Arg Leu Gly Leu  
 65 70 75 80  
 Pro Leu Val Leu Val Val Ser Ser Tyr Glu Ala Val Lys Asp Cys Phe  
 85 90 95  
 Ser Thr Asn Asp Ala Ile Phe Ser Asn Arg Pro Ala Phe Leu Tyr Gly  
 100 105 110  
 Asp Tyr Leu Gly Tyr Asn Asn Ala Met Leu Phe Leu Ala Asn Tyr Gly  
 115 120 125  
 Pro Tyr Trp Arg Lys Asn Arg Lys Leu Val Ile Gln Glu Val Leu Ser  
 130 135 140  
 Ala Ser Arg Leu Glu Lys Phe Lys His Val Arg Phe Ala Arg Ile Gln  
 145 150 155 160  
 Ala Ser Ile Lys Asn Leu Tyr Thr Arg Ile Asp Gly Asn Ser Ser Thr  
 165 170 175  
 Ile Asn Leu Thr Asp Trp Leu Glu Glu Leu Asn Phe Gly Leu Ile Val  
 180 185 190  
 Lys Met Ile Ala Gly Lys Asn Tyr Glu Ser Gly Lys Gly Asp Glu Gln  
 195 200 205  
 Val Glu Arg Phe Lys Lys Ala Phe Lys Asp Phe Met Ile Leu Ser Met  
 210 215 220  
 Glu Phe Val Leu Trp Asp Ala Phe Pro Ile Pro Leu Phe Lys Trp Val  
 225 230 235 240  
 Asp Phe Gln Gly His Val Lys Ala Met Lys Arg Thr Phe Lys Asp Ile  
 245 250 255  
 Asp Ser Val Phe Gln Asn Trp Leu Gly Glu His Ile Asn Lys Arg Glu  
 260 265 270  
 Lys Met Glu Val Asn Ala Glu Gly Asn Glu Gln Asp Phe Ile Asp Val  
 275 280 285  
 Val Leu Ser Lys Met Ser Asn Glu Tyr Leu Gly Glu Gly Tyr Ser Arg  
 290 295 300



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Asp Thr Val Ile Lys Ala Thr Val Phe Ser Leu Val Leu Asp Ala Ala  
305 310 315 320

Asp Thr Val Ala Leu His Ile Asn Trp Gly Met Ala Leu Leu Ile Asn  
325 330 335

Asn Gln Lys Ala Leu Thr Lys Ala Gln Glu Glu Ile Asp Thr Lys Val  
340 345 350

Gly Lys Asp Arg Trp Val Glu Glu Ser Asp Ile Lys Asp Leu Val Tyr  
355 360 365

Leu Gln Ala Ile Val Lys Glu Val Leu Arg Leu Tyr Pro Pro Gly Pro  
370 375 380

Leu Leu Val Pro His Glu Asn Val Glu Asp Cys Val Val Ser Gly Tyr  
385 390 395 400

His Ile Pro Lys Gly Thr Arg Leu Phe Ala Asn Val Met Lys Leu Leu  
405 410 415

Arg Asp Pro Lys Leu Trp Pro Asp Pro Asp Thr Phe Asp Pro Glu Arg  
420 425 430

Phe Ile Ala Thr Asp Ile Asp Phe Arg Gly Gln Tyr Tyr Lys Tyr Ile  
435 440 445

Pro Phe Gly Ser Gly Arg Arg Ser Cys Pro Gly Met Thr Tyr Ala Leu  
450 455 460

Gln Val Glu His Leu Thr Met Ala His Leu Ile Gln Gly Phe Asn Tyr  
465 470 475 480

Arg Thr Pro Asn Asp Glu Pro Leu Asp Met Lys Glu Gly Ala Gly Ile  
485 490 495

Thr Ile Arg Lys Val Asn Pro Val Glu Leu Ile Ile Ala Pro Arg Leu  
500 505 510

Ala Pro Glu Leu Tyr  
515

<210> 181  
<211> 1585  
<212> DNA  
<213> NICOTIANATABACUM

## 79601-7270 Sequence Listing v2 -03-25-04.ST25

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<400> 181
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tcttcttcct atggacaaaa aaatctcaaa aaccttcaaa acccttacca ccgaaaaatcc 120
ccggaggatg gccggaatc ggccatcttt tccacttcaa tgacgacggc gacgaccgtc 180
cattagctcg aaaactcggg gacttagctg acaaatacgg ccccgttttc acttttcggc 240
taggccttcc ccttgtctta gttgtaagca gttacgaagc tgtaaaagac tgtttctcta 300
caaatgacgc ctttttttcc aatcgtccag cttttcttta cggcgattac cttggctaca 360
ataatgccat gctatttttg gcccaattacg gaccttactg gcgaaaaaat cgaaaattag 420
ttattcagga agttctctcc gctagtcgtc tcgaaaaatt caaacacgtg agatttgcaa 480
gaattcaagc gagcattaag aatttatata ctcgaaattga tggaaattcg agtacgataa 540
atttaactga ttggttagaa gaattgaatt ttgggtctgat cgtgaagatg atcgctggaa 600
aaaattatga atccggtaaa ggagatgaac aagtggagag atttaagaaa gcgtttaagg 660
attttatgat tttatcaatg gagtttgtgt tatgggatgc atttccaatt ccattattta 720
aatgggtgga ttttcaaggg catgttaagg ctatgaaaag gacttttaaa gatatagatt 780
ctgtttttca gaattgggta gaggaacata ttaataaaaag agaaaaaatg gaggttaatg 840
cagaagggaa tgaacaagat ttcattgatg tggtgctttc aaaaatgagt aatgaatatc 900
ttggtgaagg ttactctcgt gatactgtca ttaaagcaac ggtgtttagt ttggtcttgg 960
atgcagcaga cacagttgct cttcacataa attggggaat ggcattattg ataaacaatc 1020
aaaaggcctt gacgaaagca caagaagaga tagacacaaa agttggtaag gacagatggg 1080
tagaagagag tgatattaag gatttggtat acctccaagc tattgttaaa gaagtgttac 1140
gattatatcc accaggacct ttgttagtac cacacgaaaa tgtagaagat tgtgttggtta 1200
gtggatatca cattcctaaa gggacaagat tattcgcaaa cgtcatgaaa ctgcaacgtg 1260
atcctaaact ctggtctgat cctgatactt tcgatccaga gagattcatt gctactgata 1320
ttgactttcg tggtcagtac tataagtata tcccgtttgg ttctggaaga cgatcttgtc 1380
cagggatgac ttatgcattg caagtggaac acttaacaat ggcacatttg atccaaggtt 1440
tcaattacag aactccaaat gacgagccct tggatatgaa ggaagggtgca ggcataacta 1500
tacgtaaggt aaatcctgtg gaactgataa tagcgccctg cctggcacct gagctttatt 1560
aaaacctaag atcatcttgc ttgat 1585

```

```

<210> 182
<211> 517
<212> PRT
<213> NICOTIANATABACUM

```

```

<400> 182

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## 79601-7270 Sequence Listing v2 -03-25-04.ST25

Met Leu Ser Pro Ile Glu Ala Ile Val Gly Leu Val Thr Phe Thr Phe  
 1 5 10 15  
 Leu Phe Phe Phe Leu Trp Thr Lys Lys Ser Gln Lys Pro Ser Lys Pro  
 20 25 30  
 Leu Pro Pro Lys Ile Pro Gly Gly Trp Pro Val Ile Gly His Leu Phe  
 35 40 45  
 His Phe Asn Asp Asp Gly Asp Asp Arg Pro Leu Ala Arg Lys Leu Gly  
 50 55 60  
 Asp Leu Ala Asp Lys Tyr Gly Pro Val Phe Thr Phe Arg Leu Gly Leu  
 65 70 75 80  
 Pro Leu Val Leu Val Val Ser Ser Tyr Glu Ala Val Lys Asp Cys Phe  
 85 90 95  
 Ser Thr Asn Asp Ala Ile Phe Ser Asn Arg Pro Ala Phe Leu Tyr Gly  
 100 105 110  
 Asp Tyr Leu Gly Tyr Asn Asn Ala Met Leu Phe Leu Ala Asn Tyr Gly  
 115 120 125  
 Pro Tyr Trp Arg Lys Asn Arg Lys Leu Val Ile Gln Glu Val Leu Ser  
 130 135 140  
 Ala Ser Arg Leu Glu Lys Phe Lys His Val Arg Phe Ala Arg Ile Gln  
 145 150 155 160  
 Ala Ser Ile Lys Asn Leu Tyr Thr Arg Ile Asp Gly Asn Ser Ser Thr  
 165 170 175  
 Ile Asn Leu Thr Asp Trp Leu Glu Glu Leu Asn Phe Gly Leu Ile Val  
 180 185 190  
 Lys Met Ile Ala Gly Lys Asn Tyr Glu Ser Gly Lys Gly Asp Glu Gln  
 195 200 205  
 Val Glu Arg Phe Lys Lys Ala Phe Lys Asp Phe Met Ile Leu Ser Met  
 210 215 220  
 Glu Phe Val Leu Trp Asp Ala Phe Pro Ile Pro Leu Phe Lys Trp Val  
 225 230 235 240  
 Asp Phe Gln Gly His Val Lys Ala Met Lys Arg Thr Phe Lys Asp Ile  
 245 250 255

79601-7270 Sequence Listing v2 -03-25-04.ST25

Asp Ser Val Phe Gln Asn Trp Leu Glu Glu His Ile Asn Lys Arg Glu  
260 265 270

Lys Met Glu Val Asn Ala Glu Gly Asn Glu Gln Asp Phe Ile Asp Val  
275 280 285

Val Leu Ser Lys Met Ser Asn Glu Tyr Leu Gly Glu Gly Tyr Ser Arg  
290 295 300

Asp Thr Val Ile Lys Ala Thr Val Phe Ser Leu Val Leu Asp Ala Ala  
305 310 315 320

Asp Thr Val Ala Leu His Ile Asn Trp Gly Met Ala Leu Leu Ile Asn  
325 330 335

Asn Gln Lys Ala Leu Thr Lys Ala Gln Glu Glu Ile Asp Thr Lys Val  
340 345 350

Gly Lys Asp Arg Trp Val Glu Glu Ser Asp Ile Lys Asp Leu Val Tyr  
355 360 365

Leu Gln Ala Ile Val Lys Glu Val Leu Arg Leu Tyr Pro Pro Gly Pro  
370 375 380

Leu Leu Val Pro His Glu Asn Val Glu Asp Cys Val Val Ser Gly Tyr  
385 390 395 400

His Ile Pro Lys Gly Thr Arg Leu Phe Ala Asn Val Met Lys Leu Gln  
405 410 415

Arg Asp Pro Lys Leu Trp Ser Asp Pro Asp Thr Phe Asp Pro Glu Arg  
420 425 430

Phe Ile Ala Thr Asp Ile Asp Phe Arg Gly Gln Tyr Tyr Lys Tyr Ile  
435 440 445

Pro Phe Gly Ser Gly Arg Arg Ser Cys Pro Gly Met Thr Tyr Ala Leu  
450 455 460

Gln Val Glu His Leu Thr Met Ala His Leu Ile Gln Gly Phe Asn Tyr  
465 470 475 480

Arg Thr Pro Asn Asp Glu Pro Leu Asp Met Lys Glu Gly Ala Gly Ile  
485 490 495

Thr Ile Arg Lys Val Asn Pro Val Glu Leu Ile Ile Ala Pro Arg Leu  
500 505 510

## 79601-7270 Sequence Listing v2 -03-25-04.ST25

Ala Pro Glu Leu Tyr  
515

<210> 183  
<211> 1620  
<212> DNA  
<213> NICOTIANATABACUM

<400> 183  
ctaaaactcc ataatggttt ctcccgtaga agccattgta ggactagtaa cccttacact 60  
tctcttctac ttcctatggc ccaaaaaatt tcaaatacct tcaaaacat taccaccgaa 120  
aattcccggg ggggtggccg taatcggcca tcttttctac ttcgatgatg acggcgacga 180  
ccgtccatta gctcgaaaac tcggagactt agctgacaaa tacggcccgg ttttactttt 240  
ccggctaggc cttccgcttg tgtaattgt aagcagttac gaagctgtaa aagactgctt 300  
ctctacaaat gacgccattt tctccaatcg tccagctttt ctttacggtg aataccttgg 360  
ctacaataat gccatgctat ttttgacaaa atacggacct tattggcgaa aaaatagaaa 420  
attagtcatt caggaagttc tctctgctag tcgtctcgaa aaattgaagc acgtgagatt 480  
tggtaaaatt caaacgagca ttaagagttt atacactcga attgatggaa attcgagtac 540  
gataaatcta actgattggg tagaagaatt gaattttggg ctgatcgtga aaatgatcgc 600  
tgggaaaaat tatgaatccg gtaaaggaga tgaacaagt gagagattta ggaaagcgta 660  
taaggatttt ataattttat caatggagtt tgtgttatgg gatgcttttc caattccatt 720  
gttcaaatgg gtggattttc aaggctatgt taaggccatg aaaaggacat ttaaggatat 780  
agattctgtt tttcagaatt ggtagagga acatgtcaag aaaagagaaa aaatggaggt 840  
taatgcacaa gggaatgaac aagatttcat tgatgtgggt ctttcaaaaa tgagtaatga 900  
atatcttgat gaaggttact ctcgtgatac tgtcataaaa gcaacagtgt ttagtttggg 960  
cttggatgct gcggacacag ttgctcttca catgaattgg ggaatggcat tactgataaa 1020  
caatcaacat gccttgaaga aagcacaaga agagatcgat aagaaagttg gtaaggaaag 1080  
atgggtagaa gagagtgata ttaaggattt ggtctacctc caagctattg ttaaagaagt 1140  
gttacgatta tatccaccag gacctttatt agtacctcat gaaaatgtag aggatttgtt 1200  
tgtagtgga tatcacattc cttaaaggac tagactattc gcgaacgtta tgaaattgca 1260  
gcgcgatcct aaactctggg caaatcctga taagtttgat ccagagagat tcttcgctga 1320  
tgatattgac taccgtgggt agcactatga gtttatccca tttggttctg gaagacgatc 1380  
ttgtccgggg atgacttatg cattacaagt ggaacaccta acaatagcac atttgatcca 1440  
gggtttcaat tacaaaactc caaatgacga gcccttggat atgaaggaag gtgcaggatt 1500  
aactatacgt aaagtaaadc ctgtagaagt gacaattacg gctcgccctg cacctgagct 1560

## 79601-7270 Sequence Listing v2 -03-25-04.ST25

ttattaaaac cttagatggt ttatcttgat tgtactaata tatatatgca gaaaaaattg 1620

<210> 184  
 <211> 517  
 <212> PRT  
 <213> NICOTIANATABACUM

<400> 184

Met Val Ser Pro Val Glu Ala Ile Val Gly Leu Val Thr Leu Thr Leu  
 1 5 10 15

Leu Phe Tyr Phe Leu Trp Pro Lys Lys Phe Gln Ile Pro Ser Lys Pro  
 20 25 30

Leu Pro Pro Lys Ile Pro Gly Gly Trp Pro Val Ile Gly His Leu Phe  
 35 40 45

Tyr Phe Asp Asp Asp Gly Asp Asp Arg Pro Leu Ala Arg Lys Leu Gly  
 50 55 60

Asp Leu Ala Asp Lys Tyr Gly Pro Val Phe Thr Phe Arg Leu Gly Leu  
 65 70 75 80

Pro Leu Val Leu Ile Val Ser Ser Tyr Glu Ala Val Lys Asp Cys Phe  
 85 90 95

Ser Thr Asn Asp Ala Ile Phe Ser Asn Arg Pro Ala Phe Leu Tyr Gly  
 100 105 110

Glu Tyr Leu Gly Tyr Asn Asn Ala Met Leu Phe Leu Thr Lys Tyr Gly  
 115 120 125

Pro Tyr Trp Arg Lys Asn Arg Lys Leu Val Ile Gln Glu Val Leu Ser  
 130 135 140

Ala Ser Arg Leu Glu Lys Leu Lys His Val Arg Phe Gly Lys Ile Gln  
 145 150 155 160

Thr Ser Ile Lys Ser Leu Tyr Thr Arg Ile Asp Gly Asn Ser Ser Thr  
 165 170 175

Ile Asn Leu Thr Asp Trp Leu Glu Glu Leu Asn Phe Gly Leu Ile Val  
 180 185 190

Lys Met Ile Ala Gly Lys Asn Tyr Glu Ser Gly Lys Gly Asp Glu Gln  
 195 200 205

## 79601-7270 Sequence Listing v2 -03-25-04.ST25

Val Glu Arg Phe Arg Lys Ala Tyr Lys Asp Phe Ile Ile Leu Ser Met  
 210 215 220  
 Glu Phe Val Leu Trp Asp Ala Phe Pro Ile Pro Leu Phe Lys Trp Val  
 225 230 235 240  
 Asp Phe Gln Gly Tyr Val Lys Ala Met Lys Arg Thr Phe Lys Asp Ile  
 245 250 255  
 Asp Ser Val Phe Gln Asn Trp Leu Glu Glu His Val Lys Lys Arg Glu  
 260 265 270  
 Lys Met Glu Val Asn Ala Gln Gly Asn Glu Gln Asp Phe Ile Asp Val  
 275 280 285  
 Val Leu Ser Lys Met Ser Asn Glu Tyr Leu Asp Glu Gly Tyr Ser Arg  
 290 295 300  
 Asp Thr Val Ile Lys Ala Thr Val Phe Ser Leu Val Leu Asp Ala Ala  
 305 310 315 320  
 Asp Thr Val Ala Leu His Met Asn Trp Gly Met Ala Leu Leu Ile Asn  
 325 330 335  
 Asn Gln His Ala Leu Lys Lys Ala Gln Glu Glu Ile Asp Lys Lys Val  
 340 345 350  
 Gly Lys Glu Arg Trp Val Glu Glu Ser Asp Ile Lys Asp Leu Val Tyr  
 355 360 365  
 Leu Gln Ala Ile Val Lys Glu Val Leu Arg Leu Tyr Pro Pro Gly Pro  
 370 375 380  
 Leu Leu Val Pro His Glu Asn Val Glu Asp Cys Val Val Ser Gly Tyr  
 385 390 395 400  
 His Ile Pro Lys Gly Thr Arg Leu Phe Ala Asn Val Met Lys Leu Gln  
 405 410 415  
 Arg Asp Pro Lys Leu Trp Ser Asn Pro Asp Lys Phe Asp Pro Glu Arg  
 420 425 430  
 Phe Phe Ala Asp Asp Ile Asp Tyr Arg Gly Gln His Tyr Glu Phe Ile  
 435 440 445  
 Pro Phe Gly Ser Gly Arg Arg Ser Cys Pro Gly Met Thr Tyr Ala Leu  
 450 455 460

## 79601-7270 Sequence Listing v2 -03-25-04.ST25

Gln Val Glu His Leu Thr Ile Ala His Leu Ile Gln Gly Phe Asn Tyr  
 465 470 475 480

Lys Thr Pro Asn Asp Glu Pro Leu Asp Met Lys Glu Gly Ala Gly Leu  
 485 490 495

Thr Ile Arg Lys Val Asn Pro Val Glu Val Thr Ile Thr Ala Arg Leu  
 500 505 510

Ala Pro Glu Leu Tyr  
 515

<210> 185  
 <211> 1623  
 <212> DNA  
 <213> NICOTIANATABACUM

<400> 185  
 cgaggctccc caccaaaaaa tcatttctct cgtctaaaat ggatcttctc ttactagaga 60  
 agaccttaat tggctctttc ttgcccattt taatcgcttt aattgtctct aaacttcgtt 120  
 caaagcgttt taagcttcct ccaggaccaa ttccagtacc agtttttggt aattggcttc 180  
 aagttggtga tgatttaaac cacagaaatc ttactgatta tgccaaaaaa ttggcgatc 240  
 ttttcttggt aagaatgggt caacgtaact tagttgttgt gtcattctct gaattagcta 300  
 aagaagtttt acacacacaa ggtgttgaat ttggttcaag aacaagaaat gttgtgtttg 360  
 atatttttac tggaaaagggt caagatatgg tttttactgt atatggtgaa cattggagaa 420  
 aaatgaggag aattatgact gtaccatttt ttactaataa agttgtgcaa cagtatagag 480  
 gggggtggga gtttgagggtg gcaagtgtaa ttgaggatgt gaaaaaaaaat cctgaatctg 540  
 ctactaatgg gatcgatta aggaggagat tacaattaat gatgtataat aatatgttta 600  
 ggattatggt tgataggaga ttgagagtg aagatgatcc ttgtttgtt aagcttaagg 660  
 ctttgaatgg tgaaaaggagt agattggctc aaagttttga gtataattat ggtgatttta 720  
 ttccaatttt gaggcctttt ttgagagggt atttgaagat ctgtaaagaa gttaaggaga 780  
 agaggctgca gcttttcaaa gattactttg ttgatgaaag aaagaagctt tcaaatacca 840  
 agagctcgga cagcaatgcc ctaaaatgtg cgattgatca cattcttgag gctcaacaga 900  
 agggagagat caatgaggac aacgttcttt acattgttga aaacatcaat gttgctgcaa 960  
 ttgaaacaac attatggtca attgagtggg gtatcgccga gctagtcaac caccctcaca 1020  
 tccaaaagaa actgcgcgac gagattgaca cagttcttgg accaggagtg caagtgactg 1080  
 aaccagacac ccacaagctt ccataccttc aggctgtgat caaggaggca cttcgtctcc 1140  
 gtatggcaat tcctctatta gtccacaca tgaaccttca cgacgcaaag cttggcgggt 1200



## 79601-7270 Sequence Listing v2 -03-25-04.ST25

```

ttgatattcc agcagagagc aaaatcttgg ttaacgcttg gtggtagct aacaacccgg 1260
ctcattggaa gaaacccgaa gagttcagac ccgagagggt ctttgaagag gagaagcatg 1320
ttgaggccaa tggcaatgac ttcagatatt ttccgtttgg cgttggtagg aggagctgcc 1380
ctggaattat acttgcatg ccaattcttg gcatcacttt gggacgtttg gttcagaact 1440
ttgagctgtt gcctcctcca ggccagtcga agctcgacac cacagagaaa ggtggacagt 1500
tcagtctcca cttttgaag cattccacca ttgtgttgaa accaagggtct ttctgaactt 1560
tgtgatctta ttaattaagg ggttctgaag aaatttgata gtgttgata ttaagggcga 1620
att 1623

```

```

<210> 186
<211> 505
<212> PRT
<213> NICOTIANATABACUM

```

```

<400> 186

```

```

Met Asp Leu Leu Leu Glu Lys Thr Leu Ile Gly Leu Phe Phe Ala
1      5      10     15

```

```

Ile Leu Ile Ala Leu Ile Val Ser Lys Leu Arg Ser Lys Arg Phe Lys
20     25     30

```

```

Leu Pro Pro Gly Pro Ile Pro Val Pro Val Phe Gly Asn Trp Leu Gln
35     40     45

```

```

Val Gly Asp Asp Leu Asn His Arg Asn Leu Thr Asp Tyr Ala Lys Lys
50     55     60

```

```

Phe Gly Asp Leu Phe Leu Leu Arg Met Gly Gln Arg Asn Leu Val Val
65     70     75     80

```

```

Val Ser Ser Pro Glu Leu Ala Lys Glu Val Leu His Thr Gln Gly Val
85     90     95

```

```

Glu Phe Gly Ser Arg Thr Arg Asn Val Val Phe Asp Ile Phe Thr Gly
100    105    110

```

```

Lys Gly Gln Asp Met Val Phe Thr Val Tyr Gly Glu His Trp Arg Lys
115    120    125

```

```

Met Arg Arg Ile Met Thr Val Pro Phe Phe Thr Asn Lys Val Val Gln
130    135    140

```

```

Gln Tyr Arg Gly Gly Trp Glu Phe Glu Val Ala Ser Val Ile Glu Asp
145    150    155    160

```

## 79601-7270 Sequence Listing v2 -03-25-04.ST25

Val Lys Lys Asn Pro Glu Ser Ala Thr Asn Gly Ile Val Leu Arg Arg  
 165 170 175  
 Arg Leu Gln Leu Met Met Tyr Asn Asn Met Phe Arg Ile Met Phe Asp  
 180 185 190  
 Arg Arg Phe Glu Ser Glu Asp Asp Pro Leu Phe Val Lys Leu Lys Ala  
 195 200 205  
 Leu Asn Gly Glu Arg Ser Arg Leu Ala Gln Ser Phe Glu Tyr Asn Tyr  
 210 215 220  
 Gly Asp Phe Ile Pro Ile Leu Arg Pro Phe Leu Arg Gly Tyr Leu Lys  
 225 230 235 240  
 Ile Cys Lys Glu Val Lys Glu Lys Arg Leu Gln Leu Phe Lys Asp Tyr  
 245 250 255  
 Phe Val Asp Glu Arg Lys Lys Leu Ser Asn Thr Lys Ser Ser Asp Ser  
 260 265 270  
 Asn Ala Leu Lys Cys Ala Ile Asp His Ile Leu Glu Ala Gln Gln Lys  
 275 280 285  
 Gly Glu Ile Asn Glu Asp Asn Val Leu Tyr Ile Val Glu Asn Ile Asn  
 290 295 300  
 Val Ala Ala Ile Glu Thr Thr Leu Trp Ser Ile Glu Trp Gly Ile Ala  
 305 310 315 320  
 Glu Leu Val Asn His Pro His Ile Gln Lys Lys Leu Arg Asp Glu Ile  
 325 330 335  
 Asp Thr Val Leu Gly Pro Gly Val Gln Val Thr Glu Pro Asp Thr His  
 340 345 350  
 Lys Leu Pro Tyr Leu Gln Ala Val Ile Lys Glu Ala Leu Arg Leu Arg  
 355 360 365  
 Met Ala Ile Pro Leu Leu Val Pro His Met Asn Leu His Asp Ala Lys  
 370 375 380  
 Leu Gly Gly Phe Asp Ile Pro Ala Glu Ser Lys Ile Leu Val Asn Ala  
 385 390 395 400  
 Trp Trp Leu Ala Asn Asn Pro Ala His Trp Lys Lys Pro Glu Glu Phe  
 405 410 415

79601-7270 Sequence Listing v2 -03-25-04.ST25

Arg Pro Glu Arg Phe Phe Glu Glu Glu Lys His Val Glu Ala Asn Gly  
420 425 430

Asn Asp Phe Arg Tyr Leu Pro Phe Gly Val Gly Arg Arg Ser Cys Pro  
435 440 445

Gly Ile Ile Leu Ala Leu Pro Ile Leu Gly Ile Thr Leu Gly Arg Leu  
450 455 460

Val Gln Asn Phe Glu Leu Leu Pro Pro Pro Gly Gln Ser Lys Leu Asp  
465 470 475 480

Thr Thr Glu Lys Gly Gly Gln Phe Ser Leu His Ile Leu Lys His Ser  
485 490 495

Thr Ile Val Leu Lys Pro Arg Ser Phe  
500 505

<210> 187  
<211> 1667  
<212> DNA  
<213> NICOTIANATABACUM

<400> 187  
caacacgctt actatctcct aaatctccac tcaaaaacaa agaagagaaa gatttaaaac 60  
taataattat gaaagagatg gtgcaaaaca atatgagcac ttctcttctt gaaactttac 120  
aagctacgcc catgatattc tacttcatcg tccctctctt ctgcttattc cttctctcca 180  
aatctcgccg taaacgtttg cctccaggct caactggctg gcctctcatt ggtaacatga 240  
tgatgatgga ccagttaact caccgtggcc ttgccaaact agcccaaaaa tatggtggtg 300  
tttttcacct taaaatgggt tatgttcaca aaattgtagt ctctggtcca gacgaagctc 360  
gccaagtatt acaggaacac gacatcatat tttcgaaccg tccagcgacc gtagccataa 420  
gttacctaac atatgacagg gcagacatgg cttttgctga ctatggactc ttctggcggc 480  
agatgagaaa actatgtgta atgaaactct tcagccgcaa acgagctgag tcatgggact 540  
cagttcgaga cgaagcggat tccatgggta gaattgtaac aaccaacaca ggcacagctg 600  
ttaacttagg tgaacttggt ttcagtctca ctcgtaatat tatctacaga gctgcttttg 660  
gaacttggtc tgaagatgga caaggcgagt tcattgaaat tatgcaagag ttttcgaagc 720  
tatttggcgc tttcaatata gctgatttta ttccatggct aggggtgggtt ggtaagcaga 780  
gtctaaatat tagacttgct aaggctagag cgctcgcttga tgggttcatt gattcgatta 840  
ttgatgacca tattattaga aagaaagctt atgttaatgg caaaaatgat ggaggtgatc 900  
gagaaaactga tatggtggat gagcttttag ctttttacag tgaggaagca aaagtaactg 960

## 79601-7270 Sequence Listing v2 -03-25-04.ST25

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agtccgaaga tttgcagaat gctatcagac ttactaagga tagtatcaaa gctatcatca 1020
tggatgtaat gtttggaggg acagaaacag tggcttctgc aatagaatgg gccatggcag 1080
agcttatgag gagtcctgaa gatcttaaaa aagtacaaca agggctggct aacgttggtg 1140
gactcaacag aaaagttgaa gaatctgact ttgaaaaatt aacatactta agatgttgct 1200
taaaagaaac tctacgactt caccctccaa tccctctcct cctccatgag accgccgagg 1260
aatccaccgt ctccggctac catattccgg caaagtcaca tgttattata aattcatttg 1320
ccattgggcg tgacaaaaat tcatgggaag atcctgaaac ttataaacca tctagggttc 1380
tcaaagaagg tgtaccagat tttaaaggag gtaattttga gtttatacca tttgggtcgg 1440
gtcggcggctc ttgccccggt atgcaacttg ggctttatgc attggaaatg gctgtggccc 1500
atcttcttca ttgttttact tgggaattgc cagatgggat gaaaccaagt gagcttaaaa 1560
tggatgatat ttttggactc actgctccaa gagctaactg actcgtggct gtgcctactc 1620
cacgcttggt gtgtcccctt tattaattga agaaaaaagg tggggct 1667

```

```

<210> 188
<211> 525
<212> PRT
<213> NICOTIANATABACUM

```

```

<400> 188

```

```

Met Lys Glu Met Val Gln Asn Asn Met Ser Thr Ser Leu Leu Glu Thr
1           5           10           15

```

```

Leu Gln Ala Thr Pro Met Ile Phe Tyr Phe Ile Val Pro Leu Phe Cys
          20           25           30

```

```

Leu Phe Leu Leu Ser Lys Ser Arg Arg Lys Arg Leu Pro Pro Gly Pro
          35           40           45

```

```

Thr Gly Trp Pro Leu Ile Gly Asn Met Met Met Met Asp Gln Leu Thr
          50           55           60

```

```

His Arg Gly Leu Ala Lys Leu Ala Gln Lys Tyr Gly Gly Val Phe His
65           70           75           80

```

```

Leu Lys Met Gly Tyr Val His Lys Ile Val Val Ser Gly Pro Asp Glu
          85           90           95

```

```

Ala Arg Gln Val Leu Gln Glu His Asp Ile Ile Phe Ser Asn Arg Pro
          100          105          110

```

```

Ala Thr Val Ala Ile Ser Tyr Leu Thr Tyr Asp Arg Ala Asp Met Ala
          115          120          125

```

79601-7270 Sequence Listing v2 -03-25-04.ST25

Phe Ala Asp Tyr Gly Leu Phe Trp Arg Gln Met Arg Lys Leu Cys Val  
 130 135 140  
 Met Lys Leu Phe Ser Arg Lys Arg Ala Glu Ser Trp Asp Ser Val Arg  
 145 150 155 160  
 Asp Glu Ala Asp Ser Met Val Arg Ile Val Thr Thr Asn Thr Gly Thr  
 165 170 175  
 Ala Val Asn Leu Gly Glu Leu Val Phe Ser Leu Thr Arg Asn Ile Ile  
 180 185 190  
 Tyr Arg Ala Ala Phe Gly Thr Cys Ser Glu Asp Gly Gln Gly Glu Phe  
 195 200 205  
 Ile Glu Ile Met Gln Glu Phe Ser Lys Leu Phe Gly Ala Phe Asn Ile  
 210 215 220  
 Ala Asp Phe Ile Pro Trp Leu Gly Trp Val Gly Lys Gln Ser Leu Asn  
 225 230 235 240  
 Ile Arg Leu Ala Lys Ala Arg Ala Ser Leu Asp Gly Phe Ile Asp Ser  
 245 250 255  
 Ile Ile Asp Asp His Ile Ile Arg Lys Lys Ala Tyr Val Asn Gly Lys  
 260 265 270  
 Asn Asp Gly Gly Asp Arg Glu Thr Asp Met Val Asp Glu Leu Leu Ala  
 275 280 285  
 Phe Tyr Ser Glu Glu Ala Lys Val Thr Glu Ser Glu Asp Leu Gln Asn  
 290 295 300  
 Ala Ile Arg Leu Thr Lys Asp Ser Ile Lys Ala Ile Ile Met Asp Val  
 305 310 315 320  
 Met Phe Gly Gly Thr Glu Thr Val Ala Ser Ala Ile Glu Trp Ala Met  
 325 330 335  
 Ala Glu Leu Met Arg Ser Pro Glu Asp Leu Lys Lys Val Gln Gln Gly  
 340 345 350  
 Leu Ala Asn Val Val Gly Leu Asn Arg Lys Val Glu Glu Ser Asp Phe  
 355 360 365  
 Glu Lys Leu Thr Tyr Leu Arg Cys Cys Leu Lys Glu Thr Leu Arg Leu  
 Page 105

## 79601-7270 Sequence Listing v2 -03-25-04.ST25

370

375

380

His Pro Pro Ile Pro Leu Leu Leu His Glu Thr Ala Glu Glu Ser Thr  
 385 390 395 400

Val Ser Gly Tyr His Ile Pro Ala Lys Ser His Val Ile Ile Asn Ser  
 405 410 415

Phe Ala Ile Gly Arg Asp Lys Asn Ser Trp Glu Asp Pro Glu Thr Tyr  
 420 425 430

Lys Pro Ser Arg Phe Leu Lys Glu Gly Val Pro Asp Phe Lys Gly Gly  
 435 440 445

Asn Phe Glu Phe Ile Pro Phe Gly Ser Gly Arg Arg Ser Cys Pro Gly  
 450 455 460

Met Gln Leu Gly Leu Tyr Ala Leu Glu Met Ala Val Ala His Leu Leu  
 465 470 475 480

His Cys Phe Thr Trp Glu Leu Pro Asp Gly Met Lys Pro Ser Glu Leu  
 485 490 495

Lys Met Asp Asp Ile Phe Gly Leu Thr Ala Pro Arg Ala Asn Arg Leu  
 500 505 510

Val Ala Val Pro Thr Pro Arg Leu Leu Cys Pro Leu Tyr  
 515 520 525

<210> 189  
 <211> 1620  
 <212> DNA  
 <213> NICOTIANATABACUM

<400> 189  
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 aattatcttt gtactaagat gggcatggaa aatcttgaat tatgtgtggt taaaaccaa 120  
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 caaaaaattg gcagcaactg gaattgcagg ctatgaaaca gataaatggg ctacacatag 480  
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## 79601-7270 Sequence Listing v2 -03-25-04.ST25

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aattctagaa gtgtcccgca caatatacat cccaggatgg aggtttttgc caacaaaaag 780
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<210> 190  
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 <212> PRT  
 <213> NICOTIANATABACUM

<400> 190

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Ile Ile Phe Val Leu Arg Trp Ala Trp Lys Ile Leu Asn Tyr Val Trp  
 20 25 30

Leu Lys Pro Lys Glu Leu Glu Lys Cys Ile Arg Gln Gln Gly Phe Lys  
 35 40 45

Gly Asn Ser Tyr Lys Phe Leu Phe Gly Asp Met Lys Glu Ile Lys Lys  
 50 55 60

Met Gly Glu Glu Ala Met Ser Lys Pro Ile Asn Phe Ser His Asp Met  
 65 70 75 80

79601-7270 Sequence Listing v2 -03-25-04.ST25

Ile Trp Pro Arg Val Met Pro Phe Ile His Lys Thr Ile Thr Asn Tyr  
85 90 95

Gly Lys Asn Cys Phe Val Trp Phe Gly Pro Arg Pro Ala Val Leu Ile  
100 105 110

Thr Asp Pro Glu Leu Val Lys Glu Val Leu Thr Lys Asn Phe Val Tyr  
115 120 125

Gln Lys Pro Pro Gly Thr Pro Leu Thr Lys Leu Ala Ala Thr Gly Ile  
130 135 140

Ala Gly Tyr Glu Thr Asp Lys Trp Ala Thr His Arg Arg Leu Leu Asn  
145 150 155 160

Pro Ala Phe His Leu Asp Lys Leu Lys His Met Leu Pro Ala Phe Gln  
165 170 175

Phe Thr Ala Cys Glu Met Leu Ser Lys Leu Glu Lys Val Val Ser Pro  
180 185 190

Asn Gly Thr Glu Ile Asp Val Trp Pro Tyr Leu Gln Thr Leu Thr Ser  
195 200 205

Asp Ala Ile Ser Arg Thr Ala Phe Gly Ser Ser Tyr Glu Glu Gly Arg  
210 215 220

Lys Leu Phe Glu Leu Gln Lys Glu Gln Leu Ser Leu Ile Leu Glu Val  
225 230 235 240

Ser Arg Thr Ile Tyr Ile Pro Gly Trp Arg Phe Leu Pro Thr Lys Arg  
245 250 255

Asn Lys Arg Met Lys Gln Ile Phe Asn Glu Val Arg Ala Leu Val Leu  
260 265 270

Gly Ile Ile Lys Lys Arg Leu Ser Met Ile Glu Asn Gly Glu Ala Pro  
275 280 285

Asp Asp Leu Leu Gly Ile Leu Leu Ala Ser Asn Leu Lys Glu Ile Gln  
290 295 300

Gln His Gly Asn Asn Lys Lys Phe Gly Met Ser Ile Asp Glu Val Ile  
305 310 315 320

Glu Glu Cys Lys Leu Phe Tyr Phe Ala Gly Gln Glu Thr Thr Ser Ser  
325 330 335



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Leu Leu Val Trp Thr Met Ile Leu Leu Cys Lys His Pro Ser Trp Gln  
340 345 350

Asp Lys Ala Arg Glu Glu Val Leu Gln Val Phe Gly Ser Arg Glu Val  
355 360 365

Asp Tyr Asp Lys Leu Asn Gln Leu Lys Ile Val Thr Met Ile Leu Asn  
370 375 380

Glu Val Leu Arg Leu Tyr Pro Ala Gly Tyr Ala Ile Asn Arg Met Val  
385 390 395 400

Thr Lys Glu Thr Lys Leu Gly Asn Leu Cys Leu Pro Ala Gly Val Gln  
405 410 415

Leu Leu Leu Pro Thr Ile Leu Leu Gln His Asp Thr Glu Ile Trp Gly  
420 425 430

Asp Asp Ala Met Glu Phe Asn Pro Glu Arg Phe Ser Asp Gly Ile Ser  
435 440 445

Lys Ala Thr Lys Gly Lys Leu Val Phe Phe Pro Phe Ser Trp Gly Pro  
450 455 460

Arg Ile Cys Ile Gly Gln Asn Phe Ala Met Leu Glu Ala Lys Met Ala  
465 470 475 480

Met Ala Met Ile Leu Lys Asn Tyr Ala Phe Glu Leu Ser Pro Ser Tyr  
485 490 495

Ala His Ala Pro His Pro Leu Leu Leu Gln Pro Gln Tyr Gly Ala Gln  
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Leu Ile Leu Tyr Lys Leu  
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<211> 1566  
<212> DNA  
<213> NICOTIANATABACUM

<400> 191  
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atggaaatta ccttttattg gaagtttaca ccatttggct gtggcaggtc cacttcctca 180  
ccatggccta aaaaatttag ccaaacgcta tggtcctctt atgcattttac aacttggaca 240

79601-7270 Sequence Listing v2 -03-25-04.ST25

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ggaactcttg agtgccaaga tgggtcaaatt ttttagctcg attcgccaag atgagctctc 480
gaagatgctc tcatctatac gaacgacacc caatcttaca gtcaatctta ctgacaaaat 540
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tgattttttc cctacatgga aaatgattca tgatattgat ggttcgaaat ctaaactggt 720
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cagagcagat ggcaagaagg gtaatggtga atttggtggt gaagatttga ttgatgtatt 840
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tttcgacatg actgagtcac ctggaatttc tgctacaaga aaggatgatc ttgttttgat 1500
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aaaagt 1566

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<210> 192  
 <211> 503  
 <212> PRT  
 <213> NICOTIANATABACUM

<400> 192

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 1 5 10 15

Ser Ile Phe Leu Leu Phe Lys Lys Trp Lys Thr Arg Lys Leu Asn Leu  
 20 25 30

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Pro Pro Gly Pro Trp Lys Leu Pro Phe Ile Gly Ser Leu His His Leu  
 35 40 45  
 Ala Val Ala Gly Pro Leu Pro His His Gly Leu Lys Asn Leu Ala Lys  
 50 55 60  
 Arg Tyr Gly Pro Leu Met His Leu Gln Leu Gly Gln Ile Pro Thr Leu  
 65 70 75 80  
 Ile Ile Ser Ser Pro Gln Met Ala Lys Glu Val Leu Lys Thr His Asp  
 85 90 95  
 Leu Ala Phe Ala Thr Arg Pro Lys Leu Val Val Ala Asp Ile Ile His  
 100 105 110  
 Tyr Asp Ser Thr Asp Ile Ala Phe Ser Pro Tyr Gly Glu Tyr Trp Arg  
 115 120 125  
 Gln Ile Arg Lys Ile Cys Ile Leu Glu Leu Leu Ser Ala Lys Met Val  
 130 135 140  
 Lys Phe Phe Ser Ser Ile Arg Gln Asp Glu Leu Ser Lys Met Leu Ser  
 145 150 155 160  
 Ser Ile Arg Thr Thr Pro Asn Leu Thr Val Asn Leu Thr Asp Lys Ile  
 165 170 175  
 Phe Trp Phe Thr Ser Ser Val Thr Cys Arg Ser Ala Leu Gly Lys Ile  
 180 185 190  
 Cys Gly Asp Gln Asp Lys Leu Ile Ile Phe Met Arg Glu Ile Ile Ser  
 195 200 205  
 Leu Ala Gly Gly Phe Ser Ile Ala Asp Phe Phe Pro Thr Trp Lys Met  
 210 215 220  
 Ile His Asp Ile Asp Gly Ser Lys Ser Lys Leu Val Lys Ala His Arg  
 225 230 235 240  
 Lys Ile Asp Glu Ile Leu Gly Asn Val Val Asp Glu His Lys Lys Asn  
 245 250 255  
 Arg Ala Asp Gly Lys Lys Gly Asn Gly Glu Phe Gly Gly Glu Asp Leu  
 260 265 270  
 Ile Asp Val Leu Leu Arg Val Arg Glu Ser Gly Glu Val Gln Ile Pro  
 275 280 285

79601-7270 Sequence Listing v2 -03-25-04.ST25

Ile Thr Asn Asp Asn Ile Lys Ser Ile Leu Ile Asp Met Phe Ser Ala  
290 295 300  
Gly Ser Glu Thr Ser Ser Thr Thr Ile Ile Trp Ala Leu Ala Glu Met  
305 310 315 320  
Met Lys Lys Pro Ser Val Leu Ala Lys Ala Gln Ala Glu Val Arg Gln  
325 330 335  
Ala Leu Lys Glu Lys Lys Gly Phe Gln Gln Ile Asp Leu Asp Glu Leu  
340 345 350  
Lys Tyr Leu Lys Leu Val Ile Lys Glu Thr Leu Arg Met His Pro Pro  
355 360 365  
Ile Pro Leu Leu Val Pro Arg Glu Cys Met Glu Asp Thr Lys Ile Asp  
370 375 380  
Gly Tyr Asn Ile Pro Phe Lys Thr Arg Val Ile Val Asn Ala Trp Ala  
385 390 395 400  
Ile Gly Arg Asp Pro Glu Ser Trp Asp Asp Pro Glu Ser Phe Met Pro  
405 410 415  
Glu Arg Phe Glu Asn Ser Ser Ile Asp Phe Leu Gly Asn His His Gln  
420 425 430  
Phe Ile Pro Phe Gly Ala Gly Arg Arg Ile Cys Pro Gly Met Leu Phe  
435 440 445  
Gly Leu Ala Asn Val Gly Gln Pro Leu Ala Gln Leu Leu Tyr His Phe  
450 455 460  
Asp Trp Lys Leu Pro Asn Gly Gln Ser His Glu Asn Phe Asp Met Thr  
465 470 475 480  
Glu Ser Pro Gly Ile Ser Ala Thr Arg Lys Asp Asp Leu Val Leu Ile  
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Ala Thr Pro Tyr Asp Ser Tyr  
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<210> 193  
<211> 1652  
<212> DNA  
<213> NICOTIANATABACUM  
<400> 193

## 79601-7270 Sequence Listing v2 -03-25-04.ST25

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cgagaagata	ttaaggtagc	aggctacgac	gttcagaaag	gaactagggg	tctcgtgagt	1260
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<210> 194  
 <211> 509  
 <212> PRT  
 <213> NICOTIANATABACUM

<400> 194

79601-7270 Sequence Listing v2 -03-25-04.ST25

Met Glu Gly Thr Asn Leu Thr Thr Tyr Ala Ala Val Phe Leu Asp Thr  
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Leu Phe Leu Leu Phe Leu Ser Lys Leu Leu Arg Gln Arg Lys Leu Asn  
20 25 30  
Leu Pro Pro Gly Pro Lys Pro Trp Pro Ile Ile Gly Asn Leu Asn Leu  
35 40 45  
Ile Gly Asn Leu Pro His Arg Ser Ile His Glu Leu Ser Leu Lys Tyr  
50 55 60  
Gly Pro Val Met Gln Leu Gln Phe Gly Ser Phe Pro Val Val Val Gly  
65 70 75 80  
Ser Ser Val Glu Met Ala Lys Ile Phe Leu Lys Ser Met Asp Ile Asn  
85 90 95  
Phe Val Gly Arg Pro Lys Thr Ala Ala Gly Lys Tyr Thr Thr Tyr Asn  
100 105 110  
Tyr Ser Asp Ile Thr Trp Ser Pro Tyr Gly Pro Tyr Trp Arg Gln Ala  
115 120 125  
Arg Arg Met Cys Leu Thr Glu Leu Phe Ser Thr Lys Arg Leu Asp Ser  
130 135 140  
Tyr Glu Tyr Ile Arg Ala Glu Glu Leu His Ser Leu Leu His Asn Leu  
145 150 155 160  
Asn Lys Ile Ser Gly Lys Pro Ile Val Leu Lys Asp Tyr Ser Thr Thr  
165 170 175  
Leu Ser Leu Asn Val Ile Ser Arg Met Val Leu Gly Lys Arg Tyr Leu  
180 185 190  
Asp Glu Ser Glu Asn Ser Phe Val Asn Pro Glu Glu Phe Lys Lys Met  
195 200 205  
Leu Asp Glu Leu Phe Leu Leu Asn Gly Val Leu Asn Ile Gly Asp Ser  
210 215 220  
Ile Pro Trp Ile Asp Phe Met Asp Leu Gln Gly Tyr Val Lys Arg Met  
225 230 235 240  
Lys Val Val Ser Lys Lys Phe Asp Lys Phe Leu Glu His Val Ile Asp  
245 250 255

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Glu His Asn Ile Arg Arg Asn Gly Val Glu Asn Tyr Val Ala Lys Asp  
260 265 270

Met Val Asp Val Leu Leu Gln Leu Ala Asp Asp Pro Lys Leu Glu Val  
275 280 285

Lys Leu Glu Arg His Gly Val Lys Ala Phe Thr Gln Asp Met Leu Ala  
290 295 300

Gly Gly Thr Glu Ser Ser Ala Val Thr Val Glu Trp Ala Ile Ser Glu  
305 310 315 320

Leu Leu Lys Lys Pro Glu Ile Phe Lys Lys Ala Thr Glu Glu Leu Asp  
325 330 335

Arg Val Ile Gly Gln Asn Arg Trp Val Gln Glu Lys Asp Ile Pro Asn  
340 345 350

Leu Pro Tyr Ile Glu Ala Ile Val Lys Glu Thr Met Arg Leu His Pro  
355 360 365

Val Ala Pro Met Leu Val Pro Arg Glu Cys Arg Glu Asp Ile Lys Val  
370 375 380

Ala Gly Tyr Asp Val Gln Lys Gly Thr Arg Val Leu Val Ser Val Trp  
385 390 395 400

Thr Ile Gly Arg Asp Pro Thr Leu Trp Asp Glu Pro Glu Val Phe Lys  
405 410 415

Pro Glu Arg Phe His Glu Arg Ser Ile Asp Val Lys Gly His Asp Tyr  
420 425 430

Glu Leu Leu Pro Phe Gly Ala Gly Arg Arg Met Cys Pro Gly Tyr Ser  
435 440 445

Leu Gly Leu Lys Val Ile Gln Ala Ser Leu Ala Asn Leu Leu His Gly  
450 455 460

Phe Asn Trp Ser Leu Pro Asp Asn Met Thr Pro Glu Asp Leu Asn Met  
465 470 475 480

Asp Glu Ile Phe Gly Leu Ser Thr Pro Lys Lys Phe Pro Leu Ala Thr  
485 490 495

<210> 195  
<211> 1657  
<212> DNA  
<213> NICOTIANATABACUM

<400> 195  
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actcacgacc tcgcttttgc cactagacca aagcttgctg tggccgacat cattcactac 360  
gacagcacgg acatagcatt ttcgccatac ggtgaatact ggagacaaat tcgtaaaatt 420  
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cttgttttga ttgccactcc ttatgattct tattaagcag tagcagaaat aaaaagccgg 1560  
ggcaaacaga aaaaagtatt gctgcttcta ggtattttct attggataaa tttcaaaatt 1620



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1657

<210> 196  
 <211> 504  
 <212> PRT  
 <213> NICOTIANATABACUM

<400> 196

Met Glu Ile Gln Phe Ser Asn Leu Val Ala Phe Leu Leu Phe Leu Ser  
 1 5 10 15

Ser Ile Phe Leu Val Phe Lys Lys Trp Lys Thr Arg Lys Leu Asn Leu  
 20 25 30

Pro Pro Gly Pro Trp Lys Leu Pro Phe Ile Gly Ser Leu His His Leu  
 35 40 45

Ala Val Ala Gly Pro Leu Pro His His Gly Leu Lys Asn Leu Ala Lys  
 50 55 60

Arg Tyr Gly Pro Leu Met His Leu Gln Leu Gly Gln Ile Pro Thr Leu  
 65 70 75 80

Val Ile Ser Ser Pro Gln Met Ala Lys Glu Val Leu Lys Thr His Asp  
 85 90 95

Leu Ala Phe Ala Thr Arg Pro Lys Leu Val Val Ala Asp Ile Ile His  
 100 105 110

Tyr Asp Ser Thr Asp Ile Ala Phe Ser Pro Tyr Gly Glu Tyr Trp Arg  
 115 120 125

Gln Ile Arg Lys Ile Cys Ile Leu Glu Leu Leu Ser Ala Lys Met Val  
 130 135 140

Lys Phe Phe Ser Ser Ile Arg Gln Asp Glu Leu Ser Lys Met Val Ser  
 145 150 155 160

Ser Ile Arg Thr Thr Pro Asn Leu Pro Val Asn Leu Thr Asp Lys Ile  
 165 170 175

Phe Trp Phe Thr Ser Ser Val Ile Cys Arg Ser Ala Leu Gly Lys Ile  
 180 185 190

Cys Gly Asp Gln Asp Lys Leu Ile Ile Phe Met Arg Glu Ile Ile Ser  
 195 200 205

Leu Ala Gly Gly Phe Ser Ile Ala Asp Phe Phe Pro Thr Trp Lys Met  
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210

215

220

Ile His Asp Ile Asp Gly Ser Lys Ser Lys Leu Val Lys Ala His Arg  
 225 230 235 240

Lys Ile Asp Glu Ile Leu Glu Asn Val Val Asn Glu His Lys Gln Asn  
 245 250 255

Arg Ala Asp Gly Lys Lys Gly Asn Gly Glu Phe Gly Gly Glu Asp Leu  
 260 265 270

Ile Asp Val Leu Leu Arg Val Arg Glu Ser Gly Glu Val Gln Ile Pro  
 275 280 285

Ile Thr Asp Asp Asn Ile Lys Ser Ile Leu Ile Asp Met Phe Ser Ala  
 290 295 300

Gly Ser Glu Thr Ser Ser Thr Thr Ile Ile Trp Ala Leu Ala Glu Met  
 305 310 315 320

Met Lys Lys Pro Ser Val Leu Ala Lys Ala Gln Ala Glu Val Arg Gln  
 325 330 335

Ala Leu Lys Gly Lys Lys Ile Ser Phe Gln Glu Ile Asp Ile Asp Lys  
 340 345 350

Leu Lys Tyr Leu Lys Leu Val Ile Lys Glu Thr Leu Arg Met His Pro  
 355 360 365

Pro Ile Pro Leu Leu Val Pro Arg Glu Cys Met Glu Asp Thr Lys Ile  
 370 375 380

Asp Gly Tyr Asn Ile Pro Phe Lys Thr Arg Val Ile Val Asn Ala Trp  
 385 390 395 400

Ala Ile Gly Arg Asp Pro Gln Ser Trp Asp Asp Pro Glu Ser Phe Thr  
 405 410 415

Pro Glu Arg Phe Glu Asn Asn Ser Ile Asp Phe Leu Gly Asn His His  
 420 425 430

Gln Phe Ile Pro Phe Gly Ala Gly Arg Arg Ile Cys Pro Gly Met Leu  
 435 440 445

Phe Gly Leu Ala Asn Val Gly Gln Pro Leu Ala Gln Leu Leu Tyr His  
 450 455 460

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Phe Asp Trp Lys Leu Pro Asn Gly Gln Ser His Glu Asn Phe Asp Met  
 465 470 475 480

Thr Glu Ser Pro Gly Ile Ser Ala Thr Arg Lys Asp Asp Leu Val Leu  
 485 490 495

Ile Ala Thr Pro Tyr Asp Ser Tyr  
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 <212> DNA  
 <213> NICOTIANATABACUM

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 cctgggtccat ggaaattacc ttttattgga agtttacacc atttggctgt ggcaggtcca 180  
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 gacagcacgg acatagcact ttcgccatac ggtgaatact ggagacaaat tcgtaaaatt 420  
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 gatgttttgt taagagttag agaaagtgga gaagttcaaa ttccaatcac agatgacaat 900  
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 atttgggcat tagctgaaat gatgaagaaa ccaagtgttt tagcaaaggc acaagctgaa 1020  
 gtgagccaag ctttgaaggg gaagaaaatt agttttcaag agattgatat tgataagcta 1080  
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 tttattccat ttggtgcagg aagaaggatt tgtcctggaa tgctatttgg tttagctaatt 1380

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 cttattttga ttgccactcc tgctcattct tgattaagta ttgctgcttt tctattggag 1560  
 aattttcaaa attcatccac aatatatagt gtttgctaga gttgggttagc 1610

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 <212> PRT  
 <213> NICOTIANATABACUM

<400> 198

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 20 25 30

Pro Pro Gly Pro Trp Lys Leu Pro Phe Ile Gly Ser Leu His His Leu  
 35 40 45

Ala Val Ala Gly Pro Leu Pro His His Gly Leu Lys Asn Leu Ala Lys  
 50 55 60

Arg Tyr Gly Pro Leu Met His Leu Gln Leu Gly Gln Ile Pro Thr Leu  
 65 70 75 80

Val Ile Ser Ser Pro Gln Met Ala Lys Glu Val Leu Lys Thr His Asp  
 85 90 95

Leu Ala Phe Ala Thr Arg Pro Lys Leu Val Val Ala Asp Ile Ile His  
 100 105 110

Tyr Asp Ser Thr Asp Ile Ala Leu Ser Pro Tyr Gly Glu Tyr Trp Arg  
 115 120 125

Gln Ile Arg Lys Ile Cys Ile Leu Glu Leu Leu Ser Ala Lys Met Val  
 130 135 140

Lys Phe Phe Ser Ser Ile Arg Gln Asp Glu Leu Ser Lys Met Val Ser  
 145 150 155 160

Ser Ile Arg Thr Thr Pro Asn Leu Pro Val Asn Leu Thr Asp Lys Ile  
 165 170 175

Phe Trp Phe Thr Ser Ser Val Ile Cys Arg Ser Ala Leu Gly Lys Ile  
 180 185 190

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Cys Gly Asp Gln Asp Lys Leu Ile Ile Phe Met Arg Glu Ile Ile Ser  
 195 200 205  
 Leu Ala Gly Gly Phe Ser Ile Ala Asp Phe Phe Pro Thr Trp Lys Met  
 210 215 220  
 Ile His Asp Ile Asp Gly Ser Lys Ser Lys Leu Val Lys Ala His Arg  
 225 230 235 240  
 Lys Ile Asp Glu Ile Leu Glu Asn Val Val Asn Glu His Lys Gln Asn  
 245 250 255  
 Arg Ala Asp Gly Lys Lys Gly Asn Gly Glu Phe Gly Gly Glu Asp Leu  
 260 265 270  
 Ile Asp Val Leu Leu Arg Val Arg Glu Ser Gly Glu Val Gln Ile Pro  
 275 280 285  
 Ile Thr Asp Asp Asn Ile Lys Ser Ile Leu Ile Asp Met Phe Ser Ala  
 290 295 300  
 Gly Ser Glu Thr Ser Ser Thr Thr Ile Ile Trp Ala Leu Ala Glu Met  
 305 310 315 320  
 Met Lys Lys Pro Ser Val Leu Ala Lys Ala Gln Ala Glu Val Ser Gln  
 325 330 335  
 Ala Leu Lys Gly Lys Lys Ile Ser Phe Gln Glu Ile Asp Ile Asp Lys  
 340 345 350  
 Leu Lys Tyr Leu Lys Leu Val Ile Lys Glu Thr Leu Arg Met His Pro  
 355 360 365  
 Pro Ile Pro Leu Leu Val Pro Arg Glu Cys Met Glu Asp Thr Lys Ile  
 370 375 380  
 Asp Gly Tyr Asn Ile Pro Phe Lys Thr Arg Val Ile Val Asn Ala Trp  
 385 390 395 400  
 Ala Ile Gly Arg Asp Pro Gln Ser Trp Asp Asp Pro Glu Ser Phe Thr  
 405 410 415  
 Pro Glu Arg Phe Glu Asn Asn Ser Ile Asp Phe Leu Gly Asn His His  
 420 425 430  
 Gln Phe Ile Pro Phe Gly Ala Gly Arg Arg Ile Cys Pro Gly Met Leu  
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435

440

445

Phe Gly Leu Ala Asn Val Gly Gln Pro Leu Ala Gln Leu Leu Tyr His  
 450 455 460

Phe Asp Trp Lys Leu Pro Asn Gly Gln Thr His Gln Asn Phe Asp Met  
 465 470 475 480

Thr Glu Ser Pro Gly Ile Ser Ala Thr Arg Lys Asp Asp Leu Ile Leu  
 485 490 495

Ile Ala Thr Pro Ala His Ser  
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&lt;210&gt; 199

&lt;211&gt; 1664

&lt;212&gt; DNA

&lt;213&gt; NICOTIANATABACUM

&lt;400&gt; 199

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caatcttact gacaaaattt tttggtttac gagttcggtg acttgtagat cagctttagg	600
gaagatatgt ggtgaccaag acaaattgat cttttttatg agggaaataa tatcattggc	660
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ggatgatctt gttttgattg ccaactccta tgattcttat taagcagtag cagaaataaa	1560
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 <212> PRT  
 <213> NICOTIANATABACUM

<400> 200

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			20					25					30		

Pro	Pro	Gly	Pro	Trp	Lys	Leu	Pro	Phe	Ile	Gly	Ser	Leu	His	His	Leu
		35					40					45			

Ala	Val	Ala	Gly	Pro	Leu	Pro	His	His	Gly	Leu	Lys	Asn	Leu	Ala	Lys
	50					55					60				

Arg	Tyr	Gly	Pro	Leu	Met	His	Leu	Gln	Leu	Gly	Gln	Ile	Pro	Thr	Leu
65					70					75					80

Ile	Ile	Ser	Ser	Pro	Gln	Met	Ala	Lys	Glu	Val	Leu	Lys	Thr	His	Asp
				85					90					95	

Leu	Ala	Phe	Ala	Thr	Arg	Pro	Lys	Leu	Val	Val	Ala	Asp	Ile	Ile	His
			100					105					110		

Tyr	Asp	Ser	Thr	Asp	Ile	Ala	Phe	Ser	Pro	Tyr	Gly	Glu	Tyr	Trp	Arg
		115					120					125			

Gln	Ile	Arg	Lys	Ile	Cys	Ile	Leu	Glu	Leu	Leu	Ser	Ala	Lys	Met	Val
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Lys	Phe	Phe	Ser	Ser	Ile	Arg	Gln	Asp	Glu	Leu	Ser	Lys	Met	Leu	Ser

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Ile Gly Arg Asp Pro Glu Ser Trp Asp Asp Pro Glu Ser Phe Met Pro  
 405 410 415

Glu Arg Phe Glu Asn Ser Ser Ile Asp Phe Leu Gly Asn His His Gln  
 420 425 430

Phe Ile Pro Phe Gly Ala Gly Arg Arg Ile Cys Pro Gly Met Leu Phe  
 435 440 445

Gly Leu Ala Asn Val Gly Gln Pro Leu Ala Gln Leu Leu Tyr His Phe  
 450 455 460

Asp Trp Lys Leu Pro Asn Gly Gln Ser His Glu Asn Phe Asp Met Thr  
 465 470 475 480

Glu Ser Pro Gly Ile Ser Ala Thr Arg Lys Asp Asp Leu Val Leu Ile  
 485 490 495

Ala Thr Pro Tyr Asp Ser Tyr  
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<210> 201  
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 <213> NICOTIANATABACUM

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 caattatact gtttatgttt gggcacccta tggccaactt tggagaattc ttcgccgatt 420  
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 attcaggtgg gttggttaca aagggtgga gaagaagatg gcctcaattc acaatagaag 780  
 aaatgaattc ttgaacagct tgcttgatga atttcgacac aagaaaagta gtgcttcaca 840  
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## 79601-7270 Sequence Listing v2 -03-25-04.ST25

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 <213> NICOTIANATABACUM

<400> 202

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 20 25 30

Arg Arg Asn Leu Pro Pro Ser Pro Phe Ser Leu Pro Ile Ile Gly His  
 35 40 45

Leu Tyr Leu Leu Lys Lys Thr Leu His Leu Thr Leu Thr Ser Leu Ser  
 50 55 60

Ala Lys Tyr Gly Pro Val Leu Tyr Leu Lys Leu Gly Ser Met Pro Val  
 65 70 75 80

Ile Val Val Ser Ser Pro Ser Ala Val Glu Glu Cys Leu Thr Lys Asn  
 85 90 95

Asp Ile Ile Phe Ala Asn Arg Pro Lys Thr Val Ala Gly Asp Lys Phe  
 100 105 110

## 79601-7270 Sequence Listing v2 -03-25-04.ST25

Thr Tyr Asn Tyr Thr Val Tyr Val Trp Ala Pro Tyr Gly Gln Leu Trp  
 115 120 125  
 Arg Ile Leu Arg Arg Leu Thr Val Val Glu Leu Phe Ser Ser His Ser  
 130 135 140  
 Leu Gln Lys Thr Ser Ile Leu Arg Asp Gln Glu Val Ala Ile Phe Ile  
 145 150 155 160  
 Arg Ser Leu Tyr Lys Phe Ser Lys Asp Ser Ser Lys Lys Val Asp Leu  
 165 170 175  
 Thr Asn Trp Ser Phe Thr Leu Val Phe Asn Leu Met Thr Lys Ile Ile  
 180 185 190  
 Ala Gly Arg His Ile Val Lys Glu Glu Asp Ala Gly Lys Glu Lys Gly  
 195 200 205  
 Ile Glu Ile Ile Glu Lys Leu Arg Gly Thr Phe Leu Val Thr Thr Ser  
 210 215 220  
 Phe Leu Asn Met Cys Asp Phe Leu Pro Val Phe Arg Trp Val Gly Tyr  
 225 230 235 240  
 Lys Gly Leu Glu Lys Lys Met Ala Ser Ile His Asn Arg Arg Asn Glu  
 245 250 255  
 Phe Leu Asn Ser Leu Leu Asp Glu Phe Arg His Lys Lys Ser Ser Ala  
 260 265 270  
 Ser Gln Ser Asn Thr Thr Val Gly Asn Met Glu Lys Lys Thr Thr Leu  
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 Ile Glu Lys Leu Leu Ser Leu Gln Glu Ser Glu Pro Glu Phe Tyr Thr  
 290 295 300  
 Asp Asp Ile Ile Lys Ser Ile Met Leu Val Val Phe Val Ala Gly Thr  
 305 310 315 320  
 Glu Thr Ser Ser Thr Thr Ile Gln Trp Val Met Arg Leu Leu Val Ala  
 325 330 335  
 His Pro Glu Ala Leu Tyr Lys Leu Arg Ala Asp Ile Asp Ser Lys Val  
 340 345 350  
 Gly Asn Lys Arg Leu Leu Asn Glu Ser Asp Leu Asn Lys Leu Pro Tyr  
 355 360 365

79601-7270 Sequence Listing v2 -03-25-04.ST25

Leu His Cys Val Val Asn Glu Thr Met Arg Leu Tyr Thr Pro Ile Pro  
370 375 380

Leu Leu Leu Pro His Tyr Ser Thr Lys Asp Cys Ile Val Glu Gly Tyr  
385 390 395 400

Asp Val Pro Lys His Thr Met Leu Phe Val Asn Ala Trp Ala Ile His  
405 410 415

Arg Asp Pro Lys Val Trp Glu Glu Pro Asp Lys Phe Lys Pro Glu Arg  
420 425 430

Phe Glu Ala Thr Glu Gly Glu Thr Glu Arg Phe Asn Tyr Lys Leu Val  
435 440 445

Pro Phe Gly Met Gly Arg Arg Ala Cys Pro Gly Ala Asp Met Gly Leu  
450 455 460

Arg Ala Val Ser Leu Ala Leu Gly Ala Leu Ile Gln Cys Phe Asp Trp  
465 470 475 480

Gln Ile Glu Glu Ala Glu Ser Leu Glu Glu Ser Tyr Asn Ser Arg Met  
485 490 495

Thr Met Gln Asn Lys Pro Leu Lys Val Val Cys Thr Pro Arg Glu Asp  
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## 79601-7270 Sequence Listing v2 -03-25-04.ST25

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 <213> NICOTIANATABACUM

<400> 204

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Ile Ser Phe Leu Phe Ile Leu Leu Lys Lys Trp Asn Thr Lys Ile Pro  
 20 25 30

Lys Leu Pro Pro Gly Pro Trp Arg Leu Pro Leu Ile Gly Ser Leu His  
 35 40 45

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His Leu Lys Gly Lys Leu Pro His His His Leu Arg Asp Leu Ala Arg  
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Lys Tyr Gly Pro Leu Met Tyr Leu Gln Leu Gly Glu Val Pro Val Val  
65 70 75 80

Val Ile Ser Ser Pro Arg Ile Ala Lys Ala Val Leu Lys Thr His Asp  
85 90 95

Leu Ala Phe Ala Thr Arg Pro Arg Phe Met Ser Ser Asp Ile Val Phe  
100 105 110

Tyr Lys Ser Arg Asp Ile Ser Phe Ala Pro Tyr Gly Asp Tyr Trp Arg  
115 120 125

Gln Met Arg Lys Ile Leu Thr Gln Glu Leu Leu Ser Asn Lys Met Leu  
130 135 140

Lys Ser Phe Ser Thr Ile Arg Lys Asp Glu Leu Ser Lys Leu Leu Ser  
145 150 155 160

Ser Ile Arg Leu Ala Thr Ala Ser Ser Ala Val Asn Ile Asn Glu Lys  
165 170 175

Leu Leu Trp Phe Thr Ser Cys Met Thr Cys Arg Leu Ala Phe Gly Lys  
180 185 190

Ile Cys Asn Asp Arg Asp Glu Leu Ile Met Leu Ile Arg Glu Ile Leu  
195 200 205

Ala Leu Ser Gly Gly Phe Asp Val Cys Asp Leu Phe Pro Ser Trp Lys  
210 215 220

Leu Leu His Asn Met Ser Asn Met Lys Ala Arg Leu Thr Asn Val His  
225 230 235 240

His Lys Tyr Asn Leu Ile Met Glu Asn Ile Ile Asn Glu His Lys Glu  
245 250 255

Asn His Ala Ala Gly Ile Lys Gly Asn Asn Glu Phe Gly Gly Glu Asp  
260 265 270

Met Ile Asp Ala Leu Leu Arg Val Lys Glu Asn Asn Glu Leu Gln Phe  
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Pro Ile Glu Asn Asp Asn Met Lys Ala Val Ile Leu Asp Leu Phe Ile  
290 295 300

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Ala Gly Thr Glu Thr Ser Tyr Thr Ala Ile Ile Trp Ala Leu Ser Glu  
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Leu Met Lys His Pro Ser Val Met Ala Lys Ala Gln Ala Glu Val Arg  
325 330 335

Lys Val Phe Lys Glu Asn Glu Asn Leu Asp Glu Asn Asp Leu Asp Lys  
340 345 350

Leu Pro Tyr Leu Lys Ser Val Ile Lys Glu Thr Leu Arg Met His Pro  
355 360 365

Pro Val Pro Leu Leu Gly Pro Arg Glu Cys Arg Glu Gln Thr Glu Ile  
370 375 380

Asp Gly Tyr Thr Val Pro Leu Lys Ala Arg Val Met Val Asn Ala Trp  
385 390 395 400

Ala Ile Gly Arg Asp Pro Glu Ser Trp Glu Asp Pro Glu Ser Phe Lys  
405 410 415

Pro Glu Arg Phe Glu Asn Ile Ser Val Asp Leu Thr Gly Asn His Tyr  
420 425 430

Gln Phe Ile Pro Phe Gly Ser Gly Arg Arg Met Cys Pro Gly Met Ser  
435 440 445

Phe Gly Leu Val Asn Thr Gly His Pro Leu Ala Gln Leu Leu Tyr Phe  
450 455 460

Phe Asp Trp Lys Phe Pro His Lys Val Asn Ala Ala Asp Phe His Thr  
465 470 475 480

Thr Glu Thr Ser Arg Val Phe Ala Ala Ser Lys Asp Asp Leu Tyr Leu  
485 490 495

Ile Pro Thr Asn His Met Glu Gln Glu  
500 505

<210> 205  
<211> 1736  
<212> DNA  
<213> NICOTIANATABACUM

<400> 205  
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ttgctttgct actcttcatt tcatttcttt ttatcctatt gaaaaagtgg aataccaaaa 120  
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tcccaaagtt acctccaggt ccatggagac ttcccccttat tggcagcctc catcacttga	180
aaggtaaact cccacaccat catcttagag atttagccccg aaaatatgga cctctcatgt	240
atttacaact tggagaagtt cctgtagttg taatatcttc gccacgtata gcaaaagctg	300
tactaaaaac tcatgatctt gcttttgcaa cgaggcctcg gttcatgtcc tcggacattg	360
tgttttacaa aagcagggac atatcattcg ccccatatgg cgattactgg agacaaatgc	420
gtaaaatatt aacacaagaa ctcttgagta acaagatgct caagtcattt agcacaatcc	480
gaaaggatgg gctctcgaag ctctctctgt cgattcgttt agcaacagct tcttctgcag	540
tgaacataaa cgaaaagctt ctctgggtta caagttgcat gacttgtaga ttagcctttg	600
gaaaaatatg caacgatcgt gatgaattga ttatgttaat aagggagata ttagcattat	660
caggaggatt tgatgtgtgt gatttgttcc cttcatggaa attacttcac aatatgagca	720
acatgaaagc tagattgacg aatgttcacc ataagtataa tctaattatg gagaatatca	780
tcaatgagca caaagagaat catgcagcag ggataaaggg aaataacgag tttggtggcg	840
aagatatgat tgatgcttta ctgaggggta aggagaataa tgagcttcaa tttcctatcg	900
aaaatgacaa catgaaagca gtaattctgg acttgtttat tgctggaact gaaacttcat	960
atactgcaat tatatgggca ctatcagaat tgatgaagca cccaagtgtt atggccaagg	1020
cacaagctga agtgagaaaa gtcttcaaag aaaatgaaaa cttggacgaa aatgatcttg	1080
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atcctgaaag tttcaaaccg gagcgatttg aaaatatctt tgttgatctt acgggaaatc	1320
actatcagtt cattcctttc ggttcaggaa gaagaatgtg tccaggaatg tcgtttggtt	1380
tagttaacac tgggcatcct ttagctcagt tgctctatct ctttgactgg aaattccctc	1440
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aagatgacct ctacttgatt ccaacaaatc acatggagca agagtagctc taaattgaat	1560
tcttgctctg gaacgataaa agaagaaact ccagcttggg ctacattatt tctttttgct	1620
ttatattagt atgggtgtgt tcagtttctt gtttttaagg gtacctgaa agataaaggg	1680
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<210> 206  
 <211> 505  
 <212> PRT  
 <213> NICOTIANATABACUM

<400> 206



## 79601-7270 Sequence Listing v2 -03-25-04.ST25

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Met Asp Ile Gln Ser Ser Pro Phe Asn Leu Ile Ala Leu Leu Leu Phe
1      5      10      15

Ile Ser Phe Leu Phe Ile Leu Leu Lys Lys Trp Asn Thr Lys Ile Pro
20      25      30

Lys Leu Pro Pro Gly Pro Trp Arg Leu Pro Leu Ile Gly Ser Leu His
35      40      45

His Leu Lys Gly Lys Leu Pro His His His Leu Arg Asp Leu Ala Arg
50      55      60

Lys Tyr Gly Pro Leu Met Tyr Leu Gln Leu Gly Glu Val Pro Val Val
65      70      75      80

Val Ile Ser Ser Pro Arg Ile Ala Lys Ala Val Leu Lys Thr His Asp
85      90      95

Leu Ala Phe Ala Thr Arg Pro Arg Phe Met Ser Ser Asp Ile Val Phe
100     105     110

Tyr Lys Ser Arg Asp Ile Ser Phe Ala Pro Tyr Gly Asp Tyr Trp Arg
115     120     125

Gln Met Arg Lys Ile Leu Thr Gln Glu Leu Leu Ser Asn Lys Met Leu
130     135     140

Lys Ser Phe Ser Thr Ile Arg Lys Asp Glu Leu Ser Lys Leu Leu Ser
145     150     155     160

Ser Ile Arg Leu Ala Thr Ala Ser Ser Ala Val Asn Ile Asn Glu Lys
165     170     175

Leu Leu Trp Phe Thr Ser Cys Met Thr Cys Arg Leu Ala Phe Gly Lys
180     185     190

Ile Cys Asn Asp Arg Asp Glu Leu Ile Met Leu Ile Arg Glu Ile Leu
195     200     205

Ala Leu Ser Gly Gly Phe Asp Val Cys Asp Leu Phe Pro Ser Trp Lys
210     215     220

Leu Leu His Asn Met Ser Asn Met Lys Ala Arg Leu Thr Asn Val His
225     230     235     240

His Lys Tyr Asn Leu Ile Met Glu Asn Ile Ile Asn Glu His Lys Glu
245     250     255

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## 79601-7270 Sequence Listing v2 -03-25-04.ST25

Asn His Ala Ala Gly Ile Lys Gly Asn Asn Glu Phe Gly Gly Glu Asp  
                   260                  265                  270  
 Met Ile Asp Ala Leu Leu Arg Val Lys Glu Asn Asn Glu Leu Gln Phe  
                   275                  280                  285  
 Pro Ile Glu Asn Asp Asn Met Lys Ala Val Ile Leu Asp Leu Phe Ile  
                   290                  295                  300  
 Ala Gly Thr Glu Thr Ser Tyr Thr Ala Ile Ile Trp Ala Leu Ser Glu  
   305                  310                  315                  320  
 Leu Met Lys His Pro Ser Val Met Ala Lys Ala Gln Ala Glu Val Arg  
                   325                  330                  335  
 Lys Val Phe Lys Glu Asn Glu Asn Leu Asp Glu Asn Asp Leu Asp Lys  
                   340                  345                  350  
 Leu Pro Tyr Leu Lys Ser Val Ile Lys Glu Thr Leu Arg Met His Pro  
                   355                  360                  365  
 Pro Val Pro Leu Leu Gly Pro Arg Glu Cys Arg Glu Gln Thr Glu Ile  
                   370                  375                  380  
 Asp Gly Tyr Thr Val Pro Leu Lys Ala Arg Val Met Val Asn Ala Trp  
   385                  390                  395                  400  
 Ala Ile Gly Arg Asp Pro Glu Ser Trp Glu Asp Pro Glu Ser Phe Lys  
                   405                  410                  415  
 Pro Glu Arg Phe Glu Asn Ile Ser Val Asp Leu Thr Gly Asn His Tyr  
                   420                  425                  430  
 Gln Phe Ile Pro Phe Gly Ser Gly Arg Arg Met Cys Pro Gly Met Ser  
                   435                  440                  445  
 Phe Gly Leu Val Asn Thr Gly His Pro Leu Ala Gln Leu Leu Tyr Leu  
                   450                  455                  460  
 Phe Asp Trp Lys Phe Pro His Lys Val Asn Ala Ala Asp Phe His Thr  
   465                  470                  475                  480  
 Thr Glu Thr Ser Arg Val Phe Ala Ala Ser Lys Asp Asp Leu Tyr Leu  
                   485                  490                  495  
 Ile Pro Thr Asn His Met Glu Gln Glu  
                   500                  505

## 79601-7270 Sequence Listing v2 -03-25-04.ST25

<210> 207  
 <211> 1823  
 <212> DNA  
 <213> NICOTIANATABACUM

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 tcccaaagtt acctccaggt ccatggagac ttccccttat tggcagcctc catcacttga 180  
 aaggtaaaact cccacaccat catcttagag atttagcccg aaaatatgga cctctcatgt 240  
 atttacaact tggagaagtt cctgtagttg taatatcttc gccacgtata gcaaaagctg 300  
 tactaaaaac tcatgatctt gcttttgcaa cgaggcctcg gttcatgtcc tcggacattg 360  
 tgttttacaa aagcagggac atatcattcg ccccatatgg cgattactgg agacaaatgc 420  
 gtaaaatatt aacacaagaa ctcttgagta acaagatgct caagtcattt agcacaatcc 480  
 gaaaggatga gctctcgaag ctctctcgt cgattcgttt agcaacagct tcttctgcag 540  
 tgaacataaa cgaaaagctt ctctggttta caagttgcat gacttgtaga ttagcctttg 600  
 gaaaaatatg caacgatcgt gatgaattga ttatgttaat aaggggagata ttagcattat 660  
 caggaggatt tgatgtgtgt gatttgttcc cttcatggaa attacttcac aatatgagca 720  
 acatgaaagc tagattgacg aatgttcacc ataagtataa tctaattatg gagaatatca 780  
 tcaatgagca caaagagaat catgcagcag ggataaaggg aaataacgag tttggtggcg 840  
 aagatatgat tgatgcttta ctgagggtta aggagaataa tgagcttcaa tttcctatcg 900  
 aaaatgacaa catgaaagca gtaattctgg acttgtttat tgctggaact gaaacttcat 960  
 atactgcaat tatatgggca ctatcagaat tgatgaagca cccaagtgtt atggccaagg 1020  
 cacaagctga agtgagaaaa gtcttcaaag aaaatgaaaa cttggacgaa aatgatcttg 1080  
 acaagttgcc atacttaaaa tcagtgatca aagaaacact aaggatgcat cctccagttc 1140  
 ctttattagg acctagagaa tgcagagaac aaactgagat tgatggatat actgtacctc 1200  
 ttaaagctag agtaatggtt aatgcatggg caattggaag agatcctgaa agttgggaag 1260  
 atcctgaaag tttcaaaccg gagcgatttg aaaatatttc tgttgatctt acgggaaatc 1320  
 actatcagtt cattcctttc gggtcaggaa gaagaatgtg tccaggaatg tcgtttggtt 1380  
 tagttaacac tgggcatcct ttagctcagt tgctctatct ctttgactgg aaattccctc 1440  
 ataagggttaa tgcagctgat tttcacacta ctgaaacaag tagagttttt gcagcaagca 1500  
 aagatgacct ctacttgatt ccaacaaatc acatggagca agagtagctc taaattgaat 1560  
 tcttgtcttg gaacaataaa agaagaaact ccagcttggg ctacattatt tccttttgct 1620  
 ttatattagt atgggtgtgt tcagtctctt gtttttaagg gtaccctgaa agataaaggg 1680

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ctatataaac cagtgaact ttttattggt tgcaagggtt tagatcaagc cataagacag 1740  
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aaaaaaaaaa aaaaaaaaaa aaa 1823

<210> 208  
<211> 505  
<212> PRT  
<213> NICOTIANATABACUM

<400> 208

Met Asp Ile Gln Ser Ser Pro Phe Asn Leu Ile Ala Leu Leu Leu Phe  
1 5 10 15

Ile Ser Phe Leu Phe Ile Leu Leu Lys Lys Trp Asn Thr Lys Ile Pro  
20 25 30

Lys Leu Pro Pro Gly Pro Trp Arg Leu Pro Leu Ile Gly Ser Leu His  
35 40 45

His Leu Lys Gly Lys Leu Pro His His His Leu Arg Asp Leu Ala Arg  
50 55 60

Lys Tyr Gly Pro Leu Met Tyr Leu Gln Leu Gly Glu Val Pro Val Val  
65 70 75 80

Val Ile Ser Ser Pro Arg Ile Ala Lys Ala Val Leu Lys Thr His Asp  
85 90 95

Leu Ala Phe Ala Thr Arg Pro Arg Phe Met Ser Ser Asp Ile Val Phe  
100 105 110

Tyr Lys Ser Arg Asp Ile Ser Phe Ala Pro Tyr Gly Asp Tyr Trp Arg  
115 120 125

Gln Met Arg Lys Ile Leu Thr Gln Glu Leu Leu Ser Asn Lys Met Leu  
130 135 140

Lys Ser Phe Ser Thr Ile Arg Lys Asp Glu Leu Ser Lys Leu Leu Ser  
145 150 155 160

Ser Ile Arg Leu Ala Thr Ala Ser Ser Ala Val Asn Ile Asn Glu Lys  
165 170 175

Leu Leu Trp Phe Thr Ser Cys Met Thr Cys Arg Leu Ala Phe Gly Lys  
180 185 190

## 79601-7270 Sequence Listing v2 -03-25-04.ST25

Ile Cys Asn Asp Arg Asp Glu Leu Ile Met Leu Ile Arg Glu Ile Leu  
 195 200 205  
 Ala Leu Ser Gly Gly Phe Asp Val Cys Asp Leu Phe Pro Ser Trp Lys  
 210 215 220  
 Leu Leu His Asn Met Ser Asn Met Lys Ala Arg Leu Thr Asn Val His  
 225 230 235 240  
 His Lys Tyr Asn Leu Ile Met Glu Asn Ile Ile Asn Glu His Lys Glu  
 245 250 255  
 Asn His Ala Ala Gly Ile Lys Gly Asn Asn Glu Phe Gly Gly Glu Asp  
 260 265 270  
 Met Ile Asp Ala Leu Leu Arg Val Lys Glu Asn Asn Glu Leu Gln Phe  
 275 280 285  
 Pro Ile Glu Asn Asp Asn Met Lys Ala Val Ile Leu Asp Leu Phe Ile  
 290 295 300  
 Ala Gly Thr Glu Thr Ser Tyr Thr Ala Ile Ile Trp Ala Leu Ser Glu  
 305 310 315 320  
 Leu Met Lys His Pro Ser Val Met Ala Lys Ala Gln Ala Glu Val Arg  
 325 330 335  
 Lys Val Phe Lys Glu Asn Glu Asn Leu Asp Glu Asn Asp Leu Asp Lys  
 340 345 350  
 Leu Pro Tyr Leu Lys Ser Val Ile Lys Glu Thr Leu Arg Met His Pro  
 355 360 365  
 Pro Val Pro Leu Leu Gly Pro Arg Glu Cys Arg Glu Gln Thr Glu Ile  
 370 375 380  
 Asp Gly Tyr Thr Val Pro Leu Lys Ala Arg Val Met Val Asn Ala Trp  
 385 390 395 400  
 Ala Ile Gly Arg Asp Pro Glu Ser Trp Glu Asp Pro Glu Ser Phe Lys  
 405 410 415  
 Pro Glu Arg Phe Glu Asn Ile Ser Val Asp Leu Thr Gly Asn His Tyr  
 420 425 430  
 Gln Phe Ile Pro Phe Gly Ser Gly Arg Arg Met Cys Pro Gly Met Ser  
 435 440 445

## 79601-7270 Sequence Listing v2 -03-25-04.ST25

Phe Gly Leu Val Asn Thr Gly His Pro Leu Ala Gln Leu Leu Tyr Leu  
 450 455 460

Phe Asp Trp Lys Phe Pro His Lys Val Asn Ala Ala Asp Phe His Thr  
 465 470 475 480

Thr Glu Thr Ser Arg Val Phe Ala Ala Ser Lys Asp Asp Leu Tyr Leu  
 485 490 495

Ile Pro Thr Asn His Met Glu Gln Glu  
 500 505

<210> 209  
 <211> 1673  
 <212> DNA  
 <213> NICOTIANATABACUM

<400> 209  
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 aaagcaaaaa gttgccacca ggtccatgga aactaccaat actaggaagt atgcttcata 180  
 tggttggtgg actaccacac catgtcctta gagatttagc caaaaaatat ggaccactta 240  
 tgcaccttca attaggtgaa gtttctgcgg ttgtggttac ttctcctgat acggcaaaag 300  
 aagtattaaa aactcatgac atcgcttttg cgtctaggcc tagccttttg gccccggaga 360  
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 ttaatgttac ggaaaggatc tttttgttca caagctccat gacatgtaga tcagcgtttg 600  
 ggcaagtgtt caaagagcaa gacaaattta tacaactaat taaagaagt atactcttag 660  
 caggaggggt tgatgtggct gacatattcc cttcactgaa gtttcttcat gtgctcagtg 720  
 gaatgaaggg taagattatg aatgcacacc ataaggtaga tgccattgtt gagaatgtca 780  
 tcaatgagca caagaaaaat cttgcaattg ggaaaactaa tggagcgta ggaggtgaag 840  
 atttaattga tgttcttcta agacttatga atgatggagg ctttcaattt cctatcacca 900  
 acgacaacat caaagctata atttttgaca tgtttgctgc cgggacagag acttcatcgt 960  
 caacaattgt gtgggctatg gtagaaatgg tgaaaaatcc agccgtattc gcgaaagctc 1020  
 aagcagaagt aagagaagca tttagaggaa aagaaacttt cgatgaaaat gatgtggagg 1080  
 agctaaacta cctaaagtta gtaataaaaag aaactctaag acttcatcca ccggttccac 1140  
 ttttgctccc aagagaatgt aggggaagaga caaatataaa cggtacact attcctgtaa 1200

## 79601-7270 Sequence Listing v2 -03-25-04.ST25

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agaccaaagt catggttaat gtttgggctt tgggaagaga tccaaaatat tggaatgacg      1260
cagaaacttt tatgccagag agatttgagc agtgctctaa ggattttggt ggtaataatt      1320
ttgaatatct tccatttggg ggcggaagga ggatttgtcc tgggatttcg tttggcttag      1380
ctaagtctta tttgccattg gctcaattac tataatcactt cgattggaaa ctccctgctg      1440
gaatcgaacc aagcgacttg gacttgactg agttggttgg agtaactgcc gctagaaaaa      1500
gtgaccttta cttggttgcg actccttatt aacctcctca aaagtgattt aatggtttca      1560
agttttttatt tcctagcaaa cccactatt gtcctatctt tcttttggtg ttttcggttt      1620
tatctactct aatacatgca tcttttacca tataggaatg taccatgttg tcg              1673

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<210> 210
<211> 514
<212> PRT
<213> NICOTIANATABACUM

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<400> 210

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Met Gln Leu Arg Phe Glu Glu Tyr Gln Leu Thr Lys Met Gln Phe Phe
1              5              10              15

```

```

Ser Leu Val Ser Ile Phe Leu Phe Leu Ser Phe Leu Phe Leu Leu Arg
20              25              30

```

```

Val Trp Lys Asn Ser Asn Ser Gln Ser Lys Lys Leu Pro Pro Gly Pro
35              40              45

```

```

Trp Lys Leu Pro Ile Leu Gly Ser Met Leu His Met Val Gly Gly Leu
50              55              60

```

```

Pro His His Val Leu Arg Asp Leu Ala Lys Lys Tyr Gly Pro Leu Met
65              70              75              80

```

```

His Leu Gln Leu Gly Glu Val Ser Ala Val Val Val Thr Ser Pro Asp
85              90              95

```

```

Thr Ala Lys Glu Val Leu Lys Thr His Asp Ile Ala Phe Ala Ser Arg
100             105             110

```

```

Pro Ser Leu Leu Ala Pro Glu Ile Val Cys Tyr Asn Arg Ser Asp Leu
115             120             125

```

```

Ala Phe Cys Pro Tyr Gly Asp Tyr Trp Arg Gln Met Arg Lys Ile Cys
130             135             140

```

```

Val Leu Glu Val Leu Ser Ala Lys Asn Val Arg Thr Phe Ser Ser Ile
145             150             155             160

```

## 79601-7270 Sequence Listing v2 -03-25-04.ST25

Arg Arg Asn Glu Val Leu Arg Leu Ile Asn Phe Ile Arg Ser Ser Ser  
 165 170 175  
 Gly Glu Pro Ile Asn Val Thr Glu Arg Ile Phe Leu Phe Thr Ser Ser  
 180 185 190  
 Met Thr Cys Arg Ser Ala Phe Gly Gln Val Phe Lys Glu Gln Asp Lys  
 195 200 205  
 Phe Ile Gln Leu Ile Lys Glu Val Ile Leu Leu Ala Gly Gly Phe Asp  
 210 215 220  
 Val Ala Asp Ile Phe Pro Ser Leu Lys Phe Leu His Val Leu Ser Gly  
 225 230 235 240  
 Met Lys Gly Lys Ile Met Asn Ala His His Lys Val Asp Ala Ile Val  
 245 250 255  
 Glu Asn Val Ile Asn Glu His Lys Lys Asn Leu Ala Ile Gly Lys Thr  
 260 265 270  
 Asn Gly Ala Leu Gly Gly Glu Asp Leu Ile Asp Val Leu Leu Arg Leu  
 275 280 285  
 Met Asn Asp Gly Gly Leu Gln Phe Pro Ile Thr Asn Asp Asn Ile Lys  
 290 295 300  
 Ala Ile Ile Phe Asp Met Phe Ala Ala Gly Thr Glu Thr Ser Ser Ser  
 305 310 315 320  
 Thr Ile Val Trp Ala Met Val Glu Met Val Lys Asn Pro Ala Val Phe  
 325 330 335  
 Ala Lys Ala Gln Ala Glu Val Arg Glu Ala Phe Arg Gly Lys Glu Thr  
 340 345 350  
 Phe Asp Glu Asn Asp Val Glu Glu Leu Asn Tyr Leu Lys Leu Val Ile  
 355 360 365  
 Lys Glu Thr Leu Arg Leu His Pro Pro Val Pro Leu Leu Leu Pro Arg  
 370 375 380  
 Glu Cys Arg Glu Glu Thr Asn Ile Asn Gly Tyr Thr Ile Pro Val Lys  
 385 390 395 400  
 Thr Lys Val Met Val Asn Val Trp Ala Leu Gly Arg Asp Pro Lys Tyr  
 405 410 415



79601-7270 Sequence Listing v2 -03-25-04.ST25

Trp Asn Asp Ala Glu Thr Phe Met Pro Glu Arg Phe Glu Gln Cys Ser  
420 425 430

Lys Asp Phe Val Gly Asn Asn Phe Glu Tyr Leu Pro Phe Gly Gly Gly  
435 440 445

Arg Arg Ile Cys Pro Gly Ile Ser Phe Gly Leu Ala Asn Ala Tyr Leu  
450 455 460

Pro Leu Ala Gln Leu Leu Tyr His Phe Asp Trp Lys Leu Pro Ala Gly  
465 470 475 480

Ile Glu Pro Ser Asp Leu Asp Leu Thr Glu Leu Val Gly Val Thr Ala  
485 490 495

Ala Arg Lys Ser Asp Leu Tyr Leu Val Ala Thr Pro Tyr Gln Pro Pro  
500 505 510

Gln Lys

<210> 211  
<211> 1673  
<212> DNA  
<213> NICOTIANATABACUM

<400> 211  
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aaagcaaaaa gttgccacca ggtccatgga aactaccaat actaggaagt atgcttcata 180  
tggttggtgg actaccacac catgtcctta gagatttagc caaaaaatat ggaccactta 240  
tgcaccttca attaggtgaa gtttctgcgg ttgtggttac ttctcctgat acggcaaaaag 300  
aagtattaaa aactcatgac atcgcttttg cgtctaggcc tagccttttg gccccggaga 360  
ttgtctgtta caatagggtct gatctagcct ttgccccta tggcgactat tggagacaaa 420  
tgcgtaaaat atgtgtcttg gaagtgtca gtgccaagaa tgttcggaca tttagctcta 480  
ttaggcggaa tgaagttctt cgtctcatta attttatccg gtcattcttct ggtgaaccta 540  
ttaatgttac ggaaaggatc tttttgttca caagctccat gacatgtaga tcagcgtttg 600  
ggcaagtgtt caaagagcaa gacaaattta tacaactaat taaagaagtg atactcttag 660  
caggaggggtt tgatgtggct gacatatcc cttcactgaa gtttcttcat gtgctcagt 720  
gaatgaaggg taagattatg aatgcacacc ataaggtaga tgccattgtt gagaatgtca 780  
tcaatgagca caagaaaaat cttgcaattg ggaaaactaa tggagcggtta ggaggtgaag 840

## 79601-7270 Sequence Listing v2 -03-25-04.ST25

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caacaattgt gtgggctatg gtagaaatgg tgaaaaatcc agccgtattc gcgaaagctc   1020
aagcagaagt aagagaagca tttagaggaa aagaaacttt cgatgaaaat gatgtggagg   1080
agctaaacta cctaaagtta gtaataaaag aaactctaag acttcatcca ccggttccac   1140
ttttgctccc aagagaatgt agggaagaga caaatataaa cggctacact attcctgtaa   1200
agaccaaagt catggttaat gtttgggctt tgggaagaga tccaaaatat tggaatgacg   1260
cagaaacttt tatgccagag agatttgagc agtgcctctaa ggattttggt ggtaataatt   1320
ttgaatatct tccatttggg gccggaagga ggatttgtcc tgggatttcg tttggcttag   1380
ctaattgctta tttgccattg gctcaattac tatatcactt cgattggaaa ctccctgctg   1440
gaatcgaacc aagcgacttg gacttgactg agttggttgg agtaactgcc gctagaaaaa   1500
gtgaccttta cttggttgcg actccttacc aacctctca aaagtgattt aatggtttca   1560
agtttttatt tcctagcaaa cccactatt gtcctatcct tcttttggtg ttttcggttt   1620
tatctactct aatacatgca tcttttacca tataggaatg taccatgttg tcg          1673

```

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<210> 212
<211> 514
<212> PRT
<213> NICOTIANATABACUM

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<400> 212
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```
Met Gln Leu Arg Phe Glu Glu Tyr Gln Leu Thr Lys Met Gln Phe Phe
1          5          10          15

```

```
Ser Leu Val Ser Ile Phe Leu Phe Leu Ser Phe Leu Phe Leu Leu Arg
20          25          30

```

```
Ile Trp Lys Asn Ser Asn Ser Gln Ser Lys Lys Leu Pro Pro Gly Pro
35          40          45

```

```
Trp Lys Leu Pro Ile Leu Gly Ser Met Leu His Met Val Gly Gly Leu
50          55          60

```

```
Pro His His Val Leu Arg Asp Leu Ala Lys Lys Tyr Gly Pro Leu Met
65          70          75          80

```

```
His Leu Gln Leu Gly Glu Val Ser Ala Val Val Val Thr Ser Pro Asp
85          90          95

```

```
Thr Ala Lys Glu Val Leu Lys Thr His Asp Ile Ala Phe Ala Ser Arg
100         105         110

```

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Pro Ser Leu Leu Ala Pro Glu Ile Val Cys Tyr Asn Arg Ser Asp Leu  
115 120 125

Ala Phe Cys Pro Tyr Gly Asp Tyr Trp Arg Gln Met Arg Lys Ile Cys  
130 135 140

Val Leu Glu Val Leu Ser Ala Lys Asn Val Arg Thr Phe Ser Ser Ile  
145 150 155 160

Arg Arg Asn Glu Val Leu Arg Leu Ile Asn Phe Ile Arg Ser Ser Ser  
165 170 175

Gly Glu Pro Ile Asn Val Thr Glu Arg Ile Phe Leu Phe Thr Ser Ser  
180 185 190

Met Thr Cys Arg Ser Ala Phe Gly Gln Val Phe Lys Glu Gln Asp Lys  
195 200 205

Phe Ile Gln Leu Ile Lys Glu Val Ile Leu Leu Ala Gly Gly Phe Asp  
210 215 220

Val Ala Asp Ile Phe Pro Ser Leu Lys Phe Leu His Val Leu Ser Gly  
225 230 235 240

Met Lys Gly Lys Ile Met Asn Ala His His Lys Val Asp Ala Ile Val  
245 250 255

Glu Asn Val Ile Asn Glu His Lys Lys Asn Leu Ala Ile Gly Lys Thr  
260 265 270

Asn Gly Ala Leu Gly Gly Glu Asp Leu Ile Asp Val Leu Leu Arg Leu  
275 280 285

Met Asn Asp Gly Gly Leu Gln Phe Pro Ile Thr Asn Asp Asn Ile Lys  
290 295 300

Ala Ile Ile Phe Asp Met Phe Ala Ala Gly Thr Glu Thr Ser Ser Ser  
305 310 315 320

Thr Ile Val Trp Ala Met Val Glu Met Val Lys Asn Pro Ala Val Phe  
325 330 335

Ala Lys Ala Gln Ala Glu Val Arg Glu Ala Phe Arg Gly Lys Glu Thr  
340 345 350

Phe Asp Glu Asn Asp Val Glu Glu Leu Asn Tyr Leu Lys Leu Val Ile  
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355

360

365

Lys Glu Thr Leu Arg Leu His Pro Pro Val Pro Leu Leu Leu Pro Arg  
 370 375 380

Glu Cys Arg Glu Glu Thr Asn Ile Asn Gly Tyr Thr Ile Pro Val Lys  
 385 390 395 400

Thr Lys Val Met Val Asn Val Trp Ala Leu Gly Arg Asp Pro Lys Tyr  
 405 410 415

Trp Asn Asp Ala Glu Thr Phe Met Pro Glu Arg Phe Glu Gln Cys Ser  
 420 425 430

Lys Asp Phe Val Gly Asn Asn Phe Glu Tyr Leu Pro Phe Gly Gly Gly  
 435 440 445

Arg Arg Ile Cys Pro Gly Ile Ser Phe Gly Leu Ala Asn Ala Tyr Leu  
 450 455 460

Pro Leu Ala Gln Leu Leu Tyr His Phe Asp Trp Lys Leu Pro Ala Gly  
 465 470 475 480

Ile Glu Pro Ser Asp Leu Asp Leu Thr Glu Leu Val Gly Val Thr Ala  
 485 490 495

Ala Arg Lys Ser Asp Leu Tyr Leu Val Ala Thr Pro Tyr Gln Pro Pro  
 500 505 510

Gln Lys

<210> 213  
 <211> 1673  
 <212> DNA  
 <213> NICOTIANATABACUM

<400> 213  
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 ccattttcct atttctatct ttcctctttt tgtaaggat atggaagaac tccaatagcc 120  
 aaagcaaaaa gttgccacca ggtccatgga aactaccaat actaggaagt atgcttcata 180  
 tggttggtgg actaccacac catgtcctta gagatttagc caaaaaatat ggaccactta 240  
 tgcaccttca attaggtgaa gtttctgcgg ttgtggttac ttctcctgat acggcaaaag 300  
 aagtattaaa aactcatgac atcgcttttg cgtctaggcc tagccttttg gccccggaga 360  
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tgcgtaaaat atgtgtccttg gaagtgtctca gtgccaagaa tgttcggaca tttagctcta	480
ttaggcggaa tgaagttctt cgtctcatta attttatccg gtcattcttct ggtgaaccta	540
ttaatgttac ggaaaggatc tttttgttca caagctccat gacatgtaga tcagcgtttg	600
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caggaggggtt tgatgtggct gacatattcc cttcactgaa gtttcttcat gtgctcagtg	720
gaatgaaggg taagattatg aatgcacacc ataaggtaga tgccattgtt gagaatgtca	780
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atttaattga tgttcctcta agacttatga atgatggagg ctttcaattt cctatcacca	900
acgacaacat caaagctata atttttgaca tgtttgctgc cgggacggag acttcatcgt	960
caacaattgt gtgggctatg gtagaaatgg tgaaaaatcc agccgtattc gcgaaagctc	1020
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cagaaacttt tatgccagag agatttgagc agtgctctaa ggattttgtt ggtaataatt	1320
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agtttttatt tcctagcaaa cccactatt gtcctatctt tcttttggtg ttttcggttt	1620
tatctactct aatacatgca tcttttacca tataggaatg taccatgttg tcg	1673

&lt;210&gt; 214

&lt;211&gt; 514

&lt;212&gt; PRT

&lt;213&gt; NICOTIANATABACUM

&lt;400&gt; 214

Met	Gln	Leu	Arg	Phe	Glu	Glu	Tyr	Gln	Leu	Thr	Lys	Val	Gln	Phe	Phe
1				5					10					15	

Ser	Leu	Val	Ser	Ile	Phe	Leu	Phe	Leu	Ser	Phe	Leu	Phe	Leu	Leu	Arg
			20					25					30		

Ile	Trp	Lys	Asn	Ser	Asn	Ser	Gln	Ser	Lys	Lys	Leu	Pro	Pro	Gly	Pro
		35					40					45			

Trp	Lys	Leu	Pro	Ile	Leu	Gly	Ser	Met	Leu	His	Met	Val	Gly	Gly	Leu

50

55

60

Pro His His Val Leu Arg Asp Leu Ala Lys Lys Tyr Gly Pro Leu Met  
65 70 75 80

His Leu Gln Leu Gly Glu Val Ser Ala Val Val Val Thr Ser Pro Asp  
85 90 95

Thr Ala Lys Glu Val Leu Lys Thr His Asp Ile Ala Phe Ala Ser Arg  
100 105 110

Pro Ser Leu Leu Ala Pro Glu Ile Val Cys Tyr Asn Arg Ser Asp Leu  
115 120 125

Ala Phe Cys Pro Tyr Gly Asp Tyr Trp Arg Gln Met Arg Lys Ile Cys  
130 135 140

Val Leu Glu Val Leu Ser Ala Lys Asn Val Arg Thr Phe Ser Ser Ile  
145 150 155 160

Arg Arg Asn Glu Val Leu Arg Leu Ile Asn Phe Ile Arg Ser Ser Ser  
165 170 175

Gly Glu Pro Ile Asn Val Thr Glu Arg Ile Phe Leu Phe Thr Ser Ser  
180 185 190

Met Thr Cys Arg Ser Ala Phe Gly Gln Val Phe Lys Glu Gln Asp Lys  
195 200 205

Phe Ile Gln Leu Ile Lys Glu Val Ile Leu Leu Ala Gly Gly Phe Asp  
210 215 220

Val Ala Asp Ile Phe Pro Ser Leu Lys Phe Leu His Val Leu Ser Gly  
225 230 235 240

Met Lys Gly Lys Ile Met Asn Ala His His Lys Val Asp Ala Ile Val  
245 250 255

Glu Asn Val Ile Asn Glu His Lys Lys Asn Leu Ala Ile Gly Lys Thr  
260 265 270

Asn Gly Ala Leu Gly Gly Glu Asp Leu Ile Asp Val Pro Leu Arg Leu  
275 280 285

Met Asn Asp Gly Gly Leu Gln Phe Pro Ile Thr Asn Asp Asn Ile Lys  
290 295 300

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Ala Ile Ile Phe Asp Met Phe Ala Ala Gly Thr Glu Thr Ser Ser Ser  
305 310 315 320

Thr Ile Val Trp Ala Met Val Glu Met Val Lys Asn Pro Ala Val Phe  
325 330 335

Ala Lys Ala Gln Ala Glu Val Arg Glu Ala Phe Arg Gly Lys Glu Thr  
340 345 350

Phe Asp Glu Asn Asp Val Glu Glu Leu Asn Tyr Leu Lys Leu Val Ile  
355 360 365

Lys Glu Thr Leu Arg Leu His Pro Pro Val Pro Leu Leu Leu Pro Arg  
370 375 380

Glu Cys Arg Glu Glu Thr Asn Ile Asn Gly Tyr Thr Ile Pro Val Lys  
385 390 400

Thr Lys Val Met Val Asn Val Trp Ala Leu Gly Arg Asp Pro Lys Tyr  
405 410 415

Trp Asn Asp Ala Glu Thr Phe Met Pro Glu Arg Phe Glu Gln Cys Ser  
420 425 430

Lys Asp Phe Val Gly Asn Asn Phe Glu Tyr Leu Pro Phe Gly Gly Gly  
435 440 445

Arg Arg Ile Cys Pro Gly Ile Ser Phe Gly Leu Ala Asn Ala Tyr Leu  
450 455 460

Pro Leu Ala Gln Leu Leu Tyr His Phe Asp Trp Lys Leu Pro Ala Gly  
465 470 475 480

Ile Glu Pro Ser Asp Leu Asp Leu Thr Glu Leu Val Gly Val Thr Ala  
485 490 495

Ala Arg Lys Ser Asp Leu Tyr Leu Val Ala Thr Pro Tyr Gln Pro Pro  
500 505 510

Gln Lys

<210> 215  
<211> 1580  
<212> DNA  
<213> NICOTIANATABACUM

<400> 215  
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gtttggcaag	gaccaacccc	cgcaatatta	ataacagagc	cagaattaat	aaaggagata	360
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gaagtttttc	aagccttttg	aagtgataaa	ccaacttttg	acgaattata	tcgcttgaaa	1140
attgtgacga	tgattttgta	cgagtcttta	aggttatatc	caccaatagc	aactcgtact	1200
cgaaggacta	atgaagaaac	aaaattaggg	gaactagatt	taccaaaggg	tgcactgctc	1260
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<210> 216

<211> 521

<212> PRT

<213> NICOTIANATABACUM

<400> 216

Met	Gly	Asn	Ala	His	Asn	Ser	Lys	Ile	Ala	Ala	Ile	Cys	Leu	Ile	Ile
1				5					10					15	



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Phe Leu Val Tyr Lys Ala Trp Glu Leu Leu Lys Trp Ile Trp Ile Lys  
20 25 30

Pro Lys Lys Leu Glu Ser Cys Leu Arg Lys Gln Gly Leu Lys Gly Asn  
35 40 45

Ser Tyr Arg Leu Phe Tyr Gly Asp Met Lys Glu Leu Ser Lys Ser Leu  
50 55 60

Lys Glu Ile Asn Ser Lys Pro Ile Ile Asn Leu Ser Asn Glu Val Ala  
65 70 75 80

Pro Arg Ile Ile Pro Tyr Tyr Leu Glu Ile Ile Gln Lys Tyr Gly Lys  
85 90 95

Arg Cys Phe Val Trp Gln Gly Pro Thr Pro Ala Ile Leu Ile Thr Glu  
100 105 110

Pro Glu Leu Ile Lys Glu Ile Phe Gly Lys Asn Tyr Val Phe Gln Lys  
115 120 125

Pro Asn Asn Pro Asn Pro Leu Thr Lys Leu Leu Ala Arg Gly Val Val  
130 135 140

Ser Tyr Glu Glu Glu Lys Trp Ala Lys His Arg Lys Ile Leu Asn Pro  
145 150 155 160

Ala Phe His Met Glu Lys Leu Lys His Met Leu Pro Ala Phe Tyr Leu  
165 170 175

Ser Cys Ser Glu Met Leu Asn Lys Trp Glu Glu Ile Ile Pro Val Lys  
180 185 190

Glu Ser Asn Glu Leu Asp Ile Trp Pro His Leu Gln Arg Met Thr Ser  
195 200 205

Asp Val Ile Ser Arg Ala Ala Phe Gly Ser Ser Tyr Glu Glu Gly Arg  
210 215 220

Arg Ile Phe Glu Leu Gln Glu Glu Gln Ala Glu Tyr Leu Thr Lys Thr  
225 230 235 240

Phe Asn Ser Val Tyr Ile Pro Gly Ser Arg Phe Phe Pro Asn Lys Met  
245 250 255

Asn Lys Arg Met Lys Glu Cys Glu Lys Glu Val Arg Glu Thr Ile Thr  
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260

265

270

Cys Leu Ile Asp Asn Arg Leu Lys Ala Lys Glu Glu Gly Asn Gly Lys  
 275 280 285

Ala Leu Asn Asp Asp Leu Leu Gly Ile Leu Leu Glu Ser Asn Ser Ile  
 290 295 300

Glu Ile Glu Glu His Gly Asn Lys Lys Phe Gly Met Ser Ile Pro Glu  
 305 310 315 320

Val Ile Glu Glu Cys Lys Leu Phe Tyr Phe Ala Gly Gln Glu Thr Thr  
 325 330 335

Ser Val Leu Leu Val Trp Thr Leu Ile Leu Leu Gly Arg Asn Pro Glu  
 340 345 350

Trp Gln Glu Arg Ala Arg Glu Glu Val Phe Gln Ala Phe Gly Ser Asp  
 355 360 365

Lys Pro Thr Phe Asp Glu Leu Tyr Arg Leu Lys Ile Val Thr Met Ile  
 370 375 380

Leu Tyr Glu Ser Leu Arg Leu Tyr Pro Pro Ile Ala Thr Arg Thr Arg  
 385 390 395 400

Arg Thr Asn Glu Glu Thr Lys Leu Gly Glu Leu Asp Leu Pro Lys Gly  
 405 410 415

Ala Leu Leu Phe Ile Pro Thr Ile Leu Leu His Leu Asp Lys Glu Ile  
 420 425 430

Trp Gly Glu Asp Ala Asp Glu Phe Asn Pro Glu Arg Phe Ser Glu Gly  
 435 440 445

Val Ala Lys Ala Thr Lys Gly Lys Met Thr Tyr Phe Pro Phe Gly Ala  
 450 455 460

Gly Pro Arg Lys Cys Ile Gly Gln Asn Phe Ala Ile Leu Glu Ala Lys  
 465 470 475 480

Met Ala Ile Ala Met Ile Leu Gln Arg Phe Ser Phe Glu Leu Ser Pro  
 485 490 495

Ser Tyr Thr His Ser Pro Tyr Thr Val Val Thr Leu Lys Pro Lys Tyr  
 500 505 510

## 79601-7270 Sequence Listing v2 -03-25-04.ST25

Gly Ala Pro Leu Ile Met His Arg Leu  
 515 520

<210> 217  
 <211> 1587  
 <212> DNA  
 <213> NICOTIANATABACUM

<400> 217  
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 tggccggtaa tcggccatct ttttcacttc aataacgacg gcgacgaccg tccattagct 180  
 cgaaagctcg gagacttagc tgataaatac ggccccgttt tcacttttctg gctaggtctt 240  
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 gccattttct ccaatcgtcc agctcttctt tacggcgaat accttggcta caataataca 360  
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 acgagcatta agaatttata cactcgaatt aatggaaatt cgagtacgat aaatctaact 540  
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 gttttatcaa tggaatttgt attatgggat gcatttccaa ttccattatt taaatgggtg 720  
 gattttcaag gtcataataa ggcaatgaaa aggacattta aggatataga ttctgttttt 780  
 cagaactggt tagaggaaca tattaataaa agagaaaaaa tagaggttgg tgcagaaggg 840  
 aatgaacaag atttcattga tgtggtgctt tcaaaattga gtaaagaata tcttgatgaa 900  
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 ttgatgaaag cacaagaaga gatagacaca aaagtgggta aggatagatg ggtagaagag 1080  
 agtgatatta aggatttagt atacctcaa gctattgtta aaaagggtgt acgattatat 1140  
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 ctcttgtaaa atcctgataa gttcgatcca gagagattca tcgctgggtga tattgacttc 1320  
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 agatgtttca tcttggttga tcattgt 1587

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<210> 218  
 <211> 517  
 <212> PRT  
 <213> NICOTIANATABACUM

<400> 218

Met Leu Ser Pro Ile Glu Ala Phe Val Gly Leu Val Thr Phe Thr Phe  
 1 5 10 15

Leu Leu Tyr Phe Leu Trp Thr Lys Lys Ser Gln Lys Leu Pro Lys Pro  
 20 25 30

Leu Pro Pro Lys Ile Pro Gly Gly Trp Pro Val Ile Gly His Leu Phe  
 35 40 45

His Phe Asn Asn Asp Gly Asp Asp Arg Pro Leu Ala Arg Lys Leu Gly  
 50 55 60

Asp Leu Ala Asp Lys Tyr Gly Pro Val Phe Thr Phe Arg Leu Gly Leu  
 65 70 75 80

Pro Leu Val Leu Val Val Ser Ser Tyr Glu Ala Ile Lys Asp Cys Phe  
 85 90 95

Ser Thr Asn Asp Ala Ile Phe Ser Asn Arg Pro Ala Leu Leu Tyr Gly  
 100 105 110

Glu Tyr Leu Gly Tyr Asn Asn Thr Met Leu Phe Leu Ala Asn Tyr Gly  
 115 120 125

Pro Tyr Trp Arg Lys Asn Arg Lys Leu Val Ile Gln Glu Val Leu Ser  
 130 135 140

Ala Ser Arg Leu Glu Lys Phe Lys Gln Val Arg Phe Thr Arg Ile Gln  
 145 150 155 160

Thr Ser Ile Lys Asn Leu Tyr Thr Arg Ile Asn Gly Asn Ser Ser Thr  
 165 170 175

Ile Asn Leu Thr Asp Trp Leu Glu Glu Leu Asn Phe Gly Leu Ile Val  
 180 185 190

Lys Met Ile Ala Gly Lys Asn Tyr Glu Ser Gly Lys Gly Asp Glu Gln  
 195 200 205

Val Glu Arg Phe Lys Asn Ala Phe Lys Asp Phe Met Val Leu Ser Met  
 210 215 220

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Glu Phe Val Leu Trp Asp Ala Phe Pro Ile Pro Leu Phe Lys Trp Val  
225 230 235 240

Asp Phe Gln Gly His Ile Lys Ala Met Lys Arg Thr Phe Lys Asp Ile  
245 250 255

Asp Ser Val Phe Gln Asn Trp Leu Glu Glu His Ile Asn Lys Arg Glu  
260 265 270

Lys Ile Glu Val Gly Ala Glu Gly Asn Glu Gln Asp Phe Ile Asp Val  
275 280 285

Val Leu Ser Lys Leu Ser Lys Glu Tyr Leu Asp Glu Gly Tyr Ser Arg  
290 295 300

Asp Thr Val Ile Lys Ala Thr Val Phe Ser Leu Val Leu Asp Ala Ala  
305 310 315 320

Asp Thr Val Ala Leu His Ile Asn Trp Gly Met Thr Leu Leu Ile Asn  
325 330 335

Asn Gln Asn Ala Leu Met Lys Ala Gln Glu Glu Ile Asp Thr Lys Val  
340 345 350

Gly Lys Asp Arg Trp Val Glu Glu Ser Asp Ile Lys Asp Leu Val Tyr  
355 360 365

Leu Gln Ala Ile Val Lys Lys Val Leu Arg Leu Tyr Pro Pro Gly Pro  
370 375 380

Leu Leu Val Pro His Glu Asn Val Lys Asp Cys Val Val Ser Gly Tyr  
385 390 395 400

His Ile Pro Lys Gly Thr Arg Leu Phe Ala Asn Val Met Lys Leu Gln  
405 410 415

Arg Asp Pro Lys Leu Leu Ser Asn Pro Asp Lys Phe Asp Pro Glu Arg  
420 425 430

Phe Ile Ala Gly Asp Ile Asp Phe Arg Gly His His Tyr Glu Phe Ile  
435 440 445

Pro Phe Gly Ser Gly Arg Arg Ser Cys Pro Gly Met Thr Tyr Ala Leu  
450 455 460

Gln Val Glu His Leu Thr Met Ala His Leu Ile Gln Gly Phe Asn Tyr

## 79601-7270 Sequence Listing v2 -03-25-04.ST25

465

470

475

480

Lys Thr Pro Asn Asp Glu Ala Leu Asp Met Lys Glu Gly Ala Gly Ile  
 485 490 495

Thr Ile Arg Lys Val Asn Pro Val Glu Leu Ile Ile Thr Pro Arg Leu  
 500 505 510

Ala Pro Glu Leu Tyr  
 515

&lt;210&gt; 219

&lt;211&gt; 1634

&lt;212&gt; DNA

&lt;213&gt; NICOTIANATABACUM

&lt;400&gt; 219

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caaaagaatt ggagaaatac ctcagacagc agggtttcaa aggaaactct tacaaattct    180
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attatggtaa gaattgtatt gtgtggtttg ggccaagacc agcagtcctg atcacagacc    360
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ctagagaaga ggttttgcaa gtgtttggga gtagggaagt tgactatgac aagttgaatc   1140
agctaaaaat agtaactatg atcttaaacg aggtcttaag gttgtatcca gcaggatatg   1200
tgattaatcg aatggtaaac aaagaaacaa agttagggaa tttgtgttta ccagccggcg   1260

```

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```

tacagctcgt gttaccaaca atgttgttgc aacatgatac tgaaatatgg ggagatgatg 1320
caatggagtt caatccagag agatttagtg atggaatatc caaagcaaca aaaggaaaac 1380
ttgtgttttt tccatttagt tgggggtccaa gaatatgtat tgggcacaaat tttgctatgt 1440
tagaggctaa aatggcaatg gctatgattc tgaaaaccta tgcatttgaa ctctctccat 1500
cttatgctca tgctcctcat ccactactac ttcaacctca atatggtgct caattaattt 1560
tgtacaagtt gtagatatgg tcaatctgga acttggtatg gaacttttat catcgtaatc 1620
aaccatattg aggg 1634

```

```

<210> 220
<211> 508
<212> PRT
<213> NICOTIANATABACUM

```

```

<400> 220

```

```

Met Glu Ile Pro Tyr Tyr Ser Leu Lys Ile Ala Ile Ser Ser Phe Ala
1           5           10          15

```

```

Ile Ile Phe Val Leu Arg Trp Ala Trp Lys Ile Leu Asn Tyr Val Trp
          20          25          30

```

```

Leu Lys Pro Lys Glu Leu Glu Lys Tyr Leu Arg Gln Gln Gly Phe Lys
          35          40          45

```

```

Gly Asn Ser Tyr Lys Phe Leu Phe Gly Asp Met Lys Glu Thr Lys Lys
          50          55          60

```

```

Met Gly Glu Glu Ala Met Ser Lys Pro Ile Asn Phe Ser His Asp Met
65          70          75          80

```

```

Ile Trp Pro Arg Val Met Pro Phe Ile His Lys Thr Ile Thr Asn Tyr
          85          90          95

```

```

Gly Lys Asn Cys Ile Val Trp Phe Gly Pro Arg Pro Ala Val Leu Ile
          100          105          110

```

```

Thr Asp Pro Glu Leu Val Lys Glu Pro Leu Gly Asn Pro Leu Thr Lys
          115          120          125

```

```

Leu Ala Ala Thr Gly Ile Ala Gly Tyr Glu Thr Asp Lys Trp Ala Thr
          130          135          140

```

```

His Arg Arg Leu Leu Asn Pro Ala Phe His Leu Asp Lys Leu Lys His
145          150          155          160

```

```

Met Leu Pro Ala Phe Gln Phe Thr Ala Ser Glu Met Leu Ser Lys Leu
Page 155

```

Glu Lys Val Val Ser Pro Asn Gly Thr Glu Ile Asp Val Trp Pro Tyr  
180 185 190

Leu Gln Thr Leu Thr Ser Asp Ala Ile Ser Arg Thr Ala Phe Gly Ser  
195 200 205

Ser Tyr Glu Glu Gly Arg Lys Ile Phe Asp Leu Gln Lys Glu Gln Leu  
210 215 220

Ser Leu Ile Leu Glu Val Ser Arg Thr Ile Tyr Ile Pro Gly Trp Arg  
225 230 235 240

Phe Leu Pro Thr Lys Arg Asn Lys Arg Met Lys Gln Ile Phe Asn Glu  
245 250 255

Val Arg Ala Leu Val Phe Gly Ile Ile Lys Lys Arg Met Ser Met Ile  
260 265 270

Glu Asn Gly Glu Ala Pro Asp Asp Leu Leu Gly Ile Leu Leu Ala Ser  
275 280 285

Asn Leu Lys Glu Ile Gln Gln His Gly Asn Asn Lys Lys Phe Gly Met  
290 295 300

Ser Ile Asp Glu Val Ile Glu Glu Cys Lys Leu Phe Tyr Phe Ala Gly  
305 310 315 320

Gln Glu Thr Thr Ser Ser Leu Leu Val Trp Thr Met Ile Leu Leu Cys  
325 330 335

Lys Tyr Pro Asn Trp Gln Asp Lys Ala Arg Glu Glu Val Leu Gln Val  
340 345 350

Phe Gly Ser Arg Glu Val Asp Tyr Asp Lys Leu Asn Gln Leu Lys Ile  
355 360 365

Val Thr Met Ile Leu Asn Glu Val Leu Arg Leu Tyr Pro Ala Gly Tyr  
370 375 380

Val Ile Asn Arg Met Val Asn Lys Glu Thr Lys Leu Gly Asn Leu Cys  
385 390 395 400

Leu Pro Ala Gly Val Gln Leu Val Leu Pro Thr Met Leu Leu Gln His  
405 410 415



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Asp Thr Glu Ile Trp Gly Asp Asp Ala Met Glu Phe Asn Pro Glu Arg  
420 425 430

Phe Ser Asp Gly Ile Ser Lys Ala Thr Lys Gly Lys Leu Val Phe Phe  
435 440 445

Pro Phe Ser Trp Gly Pro Arg Ile Cys Ile Gly Gln Asn Phe Ala Met  
450 455 460

Leu Glu Ala Lys Met Ala Met Ala Met Ile Leu Lys Thr Tyr Ala Phe  
465 470 475 480

Glu Leu Ser Pro Ser Tyr Ala His Ala Pro His Pro Leu Leu Leu Gln  
485 490 495

Pro Gln Tyr Gly Ala Gln Leu Ile Leu Tyr Lys Leu  
500 505

<210> 221  
<211> 1593  
<212> DNA  
<213> NICOTIANATABACUM

<400> 221  
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tgcccggtta tcggccacct ttttcacttc aataacgacg gcgacgaccg tccattagct 180  
cgaaaactcg gagacttagc tgataaatac ggccccgttt tcacttttcg gctaggtctt 240  
ccccttgtag tagttgtaag cagttacgaa gctacaaaag attgcttctc taaaaatgac 300  
gccattttct ccaatcgctc agcttttctt tacggcgaat accttggcta caataatata 360  
atgctttttc tagcaaatta cggaccttac tggcgaaaaa atcgtaaatt agtcattcag 420  
gaagtctctc ctgctagtcg tctcgaaaaa ttcaaacaag tgagattcac cagaattcaa 480  
acgagcatta agaatttata cactcgaatt aatggaaatt cgagtacgat aaatctaact 540  
gattggtttag aagaattgaa ttttggctctg atcgtgaaaa tgatcgctgg gaaaaattat 600  
gaatccggta aaggagatga acaagtggaa agatttaaga atgcgtttta ggattttatg 660  
gttttatcaa tggaatttgt attatgggat gcatttccaa ttccattatt taaatgggtg 720  
gattttcaag gtcataattaa gacaatgaaa aggacattta aggatataga ttctgttttt 780  
cagaactggt tagaggaaca tattaataaa agagaaaaaa tggagggttg tgcagaaggg 840  
aatgaacaag atttcattga tgtggtgctt tcaaaattga gtaaagaata tcttgatgaa 900  
ggttactctc gtgatactgt cattaaagca acagttttta gtttggctct ggatgcagca 960  
gacacagttg ctcttcacat aaattgggga atgacattat tgataaacia tcaaatgcc 1020

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```

ttgatgaaag cacaagaaga gatagacaca aaagttggta aggatagatg ggtagaagag 1080
agtgatatta aggatttagt atacctccaa gctattgtta aaaagggtgtt acgattatat 1140
ccaccaggac ctttgtagt accacatgaa aatgtaaagg attgtgttgt tagtggatat 1200
cacattccta aagggactag attattcgca aacgtcatga aactgcagcg cgatcctaaa 1260
ctcttgtcaa atcctgataa gttcgatcca gagagattca tcgctgggtga tattgacttc 1320
cgtgggcacc actatgagtt tatcccatct ggttctggaa gacgatcttg tccgggggatg 1380
acttatgcat tgcaagtgga acacctaaca atggcacatt taatccaggg tttcaattac 1440
aaaactccaa atgacgaggt cttggatatg aaggaagggtg caggcataac aatacgtaag 1500
gtaaattcag tggaattgat aataacgcct cgcttggcac ctgagcttta ctaaaaccta 1560
agatctttca tcttggttga tcattgttta ata 1593

```

```

<210> 222
<211> 517
<212> PRT
<213> NICOTIANATABACUM
<400> 222

```

```

Met Val Phe Pro Ile Glu Ala Phe Val Gly Leu Val Thr Phe Thr Phe
1      5      10      15

```

```

Leu Leu Tyr Phe Leu Trp Thr Lys Lys Ser Gln Lys Leu Pro Lys Pro
20      25      30

```

```

Leu Pro Pro Lys Ile Pro Gly Gly Trp Pro Val Ile Gly His Leu Phe
35      40      45

```

```

His Phe Asn Asn Asp Gly Asp Asp Arg Pro Leu Ala Arg Lys Leu Gly
50      55      60

```

```

Asp Leu Ala Asp Lys Tyr Gly Pro Val Phe Thr Phe Arg Leu Gly Leu
65      70      75      80

```

```

Pro Leu Val Leu Val Val Ser Ser Tyr Glu Ala Thr Lys Asp Cys Phe
85      90      95

```

```

Ser Thr Asn Asp Ala Ile Phe Ser Asn Arg Pro Ala Phe Leu Tyr Gly
100     105     110

```

```

Glu Tyr Leu Gly Tyr Asn Asn Thr Met Leu Phe Leu Ala Asn Tyr Gly
115     120     125

```

```

Pro Tyr Trp Arg Lys Asn Arg Lys Leu Val Ile Gln Glu Val Leu Ser
130     135     140

```

79601-7270 Sequence Listing v2 -03-25-04.ST25

Ala Ser Arg Leu Glu Lys Phe Lys Gln Val Arg Phe Thr Arg Ile Gln  
145 150 155 160

Thr Ser Ile Lys Asn Leu Tyr Thr Arg Ile Asn Gly Asn Ser Ser Thr  
165 170 175

Ile Asn Leu Thr Asp Trp Leu Glu Glu Leu Asn Phe Gly Leu Ile Val  
180 185 190

Lys Met Ile Ala Gly Lys Asn Tyr Glu Ser Gly Lys Gly Asp Glu Gln  
195 200 205

Val Glu Arg Phe Lys Asn Ala Phe Lys Asp Phe Met Val Leu Ser Met  
210 215 220

Glu Phe Val Leu Trp Asp Ala Phe Pro Ile Pro Leu Phe Lys Trp Val  
225 230 235 240

Asp Phe Gln Gly His Ile Lys Thr Met Lys Arg Thr Phe Lys Asp Ile  
245 250 255

Asp Ser Val Phe Gln Asn Trp Leu Glu Glu His Ile Asn Lys Arg Glu  
260 265 270

Lys Met Glu Val Gly Ala Glu Gly Asn Glu Gln Asp Phe Ile Asp Val  
275 280 285

Val Leu Ser Lys Leu Ser Lys Glu Tyr Leu Asp Glu Gly Tyr Ser Arg  
290 295 300

Asp Thr Val Ile Lys Ala Thr Val Phe Ser Leu Val Leu Asp Ala Ala  
305 310 315 320

Asp Thr Val Ala Leu His Ile Asn Trp Gly Met Thr Leu Leu Ile Asn  
325 330 335

Asn Gln Asn Ala Leu Met Lys Ala Gln Glu Glu Ile Asp Thr Lys Val  
340 345 350

Gly Lys Asp Arg Trp Val Glu Glu Ser Asp Ile Lys Asp Leu Val Tyr  
355 360 365

Leu Gln Ala Ile Val Lys Lys Val Leu Arg Leu Tyr Pro Pro Gly Pro  
370 375 380

Leu Leu Val Pro His Glu Asn Val Lys Asp Cys Val Val Ser Gly Tyr  
Page 159

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385

390

395

400

His Ile Pro Lys Gly Thr Arg Leu Phe Ala Asn Val Met Lys Leu Gln  
 405 410 415

Arg Asp Pro Lys Leu Leu Ser Asn Pro Asp Lys Phe Asp Pro Glu Arg  
 420 425 430

Phe Ile Ala Gly Asp Ile Asp Phe Arg Gly His His Tyr Glu Phe Ile  
 435 440 445

Pro Ser Gly Ser Gly Arg Arg Ser Cys Pro Gly Met Thr Tyr Ala Leu  
 450 455 460

Gln Val Glu His Leu Thr Met Ala His Leu Ile Gln Gly Phe Asn Tyr  
 465 470 475 480

Lys Thr Pro Asn Asp Glu Val Leu Asp Met Lys Glu Gly Ala Gly Ile  
 485 490 495

Thr Ile Arg Lys Val Asn Pro Val Glu Leu Ile Ile Thr Pro Arg Leu  
 500 505 510

Ala Pro Glu Leu Tyr  
 515

&lt;210&gt; 223

&lt;211&gt; 1580

&lt;212&gt; DNA

&lt;213&gt; NICOTIANATABACUM

&lt;400&gt; 223

atgctttctc ccatagaagc cattgtagga ctagtaacct tcacatttct cttcttcttc	60
ctatggacaa aaaaatctca aaaccttca aaacccttac caccgaaaat ccccgaggga	120
tggccggtaa tcggccatct tttccacttc aatgacgacg gcgacgaccg tccattagct	180
cgaaaactcg gagacttagc tgacaaatac ggccccgttt tcacttttcg gctaggcctt	240
ccccttgtct tagttgtaag cagttacgaa gctgtaaaaag actgtttctc cacaaatgac	300
gccatttttt ccaatcgtcc agcttttctt tacggcgatt accttggcta caataatgcc	360
atgctatttt tggccaatta cggaccttac tggcgaaaaa atcgaaaatt agttattcag	420
gaagttctct ccgctagtcg tctcgaaaaa ttcaaacacg tgagatttgc aagaattcaa	480
gcgagcatga agaatttata tactcgaaatt gatggaaatt cgagtacgat aaatttaact	540
gattggttag aagaattgaa ttttggctctg atcgtgaaga tgatcgctgg aaaaaattat	600
gaatccggta aaggagatga acaagtggag agatttaaga aagcgtttaa ggattttatg	660

## 79601-7270 Sequence Listing v2 -03-25-04.ST25

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attttatcaa tggagtttgt gttatgggat gcatttccaa ttccattatt taaatgggtg 720
gattttcaag ggcatgttaa ggctatgaaa aggactttta aagatataga ttctgttttt 780
cagaattggt tagaggaaca tattaataaa agagaaaaaa tggagggttaa tgcagaaggg 840
aatgaacaag atttcattga tgtggtgctt tcaaaaatga gtaatgaata tcttggtgaa 900
ggttactctc gtgatactgt cattgaagca acggtgttta gtttggtctt ggatgcagca 960
gacacagttg ctcttcacat aaattgggga atggcattat tgataaacia tcaaaaggcc 1020
ttgacgaaag cacaagaaga gatagacaca aaagtttgta aggacagatg ggtagaagag 1080
agtgatatta aggatttggt atacctcaa gctattgta aagaagtgtt acgattatat 1140
ccaccaggac ctttgtagt accacacgaa aatgtagaag attgtgttgt tagtggatat 1200
cacattccta aagggaaca attattcgca aacgtcatga aactgcaacg tgatcctaaa 1260
ctctggtctg atcctgatac tttcgatcca gagagattca ttgctactga tattgacttt 1320
cgtggtcagt actataagta tatcccggtt ggtcctggaa gacgatcttg tccagggatg 1380
acttatgcat tgcaagtgga acacttaaca atggcacatt tgatccaagg tttcaattac 1440
agaactcaa atgacgagcc cttggatatg aaggaagggtg caggcataac tatacgtaag 1500
gtaaactcctg tggaactgat aatagcgct cgcctggcac ctgagcttta ttaaaaccta 1560
agatgtttca tcttggttga 1580

```

<210> 224  
 <211> 517  
 <212> PRT  
 <213> NICOTIANATABACUM

<400> 224

Met Leu Ser Pro Ile Glu Ala Ile Val Gly Leu Val Thr Phe Thr Phe  
1 5 10 15

Leu Phe Phe Phe Leu Trp Thr Lys Lys Ser Gln Lys Pro Ser Lys Pro  
20 25 30

Leu Pro Pro Lys Ile Pro Gly Gly Trp Pro Val Ile Gly His Leu Phe  
35 40 45

His Phe Asn Asp Asp Gly Asp Asp Arg Pro Leu Ala Arg Lys Leu Gly  
50 55 60

Asp Leu Ala Asp Lys Tyr Gly Pro Val Phe Thr Phe Arg Leu Gly Leu  
65 70 75 80

Pro Leu Val Leu Val Val Ser Ser Tyr Glu Ala Val Lys Asp Cys Phe  
85 90 95

## 79601-7270 Sequence Listing v2 -03-25-04.ST25

Ser Thr Asn Asp Ala Ile Phe Ser Asn Arg Pro Ala Phe Leu Tyr Gly  
 100 105 110  
 Asp Tyr Leu Gly Tyr Asn Asn Ala Met Leu Phe Leu Ala Asn Tyr Gly  
 115 120 125  
 Pro Tyr Trp Arg Lys Asn Arg Lys Leu Val Ile Gln Glu Val Leu Ser  
 130 135 140  
 Ala Ser Arg Leu Glu Lys Phe Lys His Val Arg Phe Ala Arg Ile Gln  
 145 150 155 160  
 Ala Ser Met Lys Asn Leu Tyr Thr Arg Ile Asp Gly Asn Ser Ser Thr  
 165 170 175  
 Ile Asn Leu Thr Asp Trp Leu Glu Glu Leu Asn Phe Gly Leu Ile Val  
 180 185 190  
 Lys Met Ile Ala Gly Lys Asn Tyr Glu Ser Gly Lys Gly Asp Glu Gln  
 195 200 205  
 Val Glu Arg Phe Lys Lys Ala Phe Lys Asp Phe Met Ile Leu Ser Met  
 210 215 220  
 Glu Phe Val Leu Trp Asp Ala Phe Pro Ile Pro Leu Phe Lys Trp Val  
 225 230 235 240  
 Asp Phe Gln Gly His Val Lys Ala Met Lys Arg Thr Phe Lys Asp Ile  
 245 250 255  
 Asp Ser Val Phe Gln Asn Trp Leu Glu Glu His Ile Asn Lys Arg Glu  
 260 265 270  
 Lys Met Glu Val Asn Ala Glu Gly Asn Glu Gln Asp Phe Ile Asp Val  
 275 280 285  
 Val Leu Ser Lys Met Ser Asn Glu Tyr Leu Gly Glu Gly Tyr Ser Arg  
 290 295 300  
 Asp Thr Val Ile Glu Ala Thr Val Phe Ser Leu Val Leu Asp Ala Ala  
 305 310 315 320  
 Asp Thr Val Ala Leu His Ile Asn Trp Gly Met Ala Leu Leu Ile Asn  
 325 330 335  
 Asn Gln Lys Ala Leu Thr Lys Ala Gln Glu Glu Ile Asp Thr Lys Val  
 340 345 350

79601-7270 Sequence Listing v2 -03-25-04.ST25

Cys Lys Asp Arg Trp Val Glu Glu Ser Asp Ile Lys Asp Leu Val Tyr  
355 360 365

Leu Gln Ala Ile Val Lys Glu Val Leu Arg Leu Tyr Pro Pro Gly Pro  
370 375 380

Leu Leu Val Pro His Glu Asn Val Glu Asp Cys Val Val Ser Gly Tyr  
385 390 395 400

His Ile Pro Lys Gly Thr Arg Leu Phe Ala Asn Val Met Lys Leu Gln  
405 410 415

Arg Asp Pro Lys Leu Trp Ser Asp Pro Asp Thr Phe Asp Pro Glu Arg  
420 425 430

Phe Ile Ala Thr Asp Ile Asp Phe Arg Gly Gln Tyr Tyr Lys Tyr Ile  
435 440 445

Pro Phe Gly Pro Gly Arg Arg Ser Cys Pro Gly Met Thr Tyr Ala Leu  
450 455 460

Gln Val Glu His Leu Thr Met Ala His Leu Ile Gln Gly Phe Asn Tyr  
465 470 475 480

Arg Thr Pro Asn Asp Glu Pro Leu Asp Met Lys Glu Gly Ala Gly Ile  
485 490 495

Thr Ile Arg Lys Val Asn Pro Val Glu Leu Ile Ile Ala Pro Arg Leu  
500 505 510

Ala Pro Glu Leu Tyr  
515

<210> 225  
<211> 1639  
<212> DNA  
<213> NICOTIANATABACUM

<400> 225  
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agaagccatt gtaggatttg taaccttttc atttctattc tactttctat ggaccaaaaa 120  
acaatcaaaa atcttaaacc cactacctcc aaaaatccca ggtggatggc cagtaatcgg 180  
ccatctcttt tatttcaaga acaatggcga tgaagatcgc catttttctc aaaaactcgg 240  
tgacttagct gacaaatatg gtcccgctct cactttccgg ttagggtttc gccgtttctt 300  
ggcggtagt agttatgaag ctatgaaaga atgcttcact accaatgata tccatttcgc 360

79601-7270 Sequence Listing v2 -03-25-04.ST25

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cgatcggcca tctttactct acggagaata cctttgctat aataacgcca tgcttgctgt    420
tgccaaatat ggcccttact ggaaaaaaaa tcgaaagtta gtcaatcaag aagttctctc    480
cgttagtcgg ctcgaaaaat tcaaacaatgt tagattttct ataattcaga aaaatattaa    540
acaattgtat aattgtgatt caccaatggg gaagataaac cttagtgatt ggatagataa    600
attgacattc gacatcattt tgaaaatggg tgttgggaag aactataata atggacatgg    660
agaaatactc aaagttgctt ttcagaaatt catggttcaa gctatggaga tggagctcta    720
tgatgttttt cacattccat ttttcaagtg gttggatctt acaggggaata ttaaggctat    780
gaaacaaact ttcaaagaca ttgataatat tatccaaggt tggttagatg agcacattaa    840
gaagagagaa acaaaggatg ttggagggtg aaacgaacaa gattttatag atgtggtgct    900
ttccaagatg agcgacgaac atcttggcga gggttactct catgacacaa ccatcaaagc    960
aactgtattc actttggtct tggatgcaac agacacactt gcacttcata taaagtgggt   1020
aatggcggtt atgataaaca ataagcatgt catgaagaaa gcacaagaag agatggacac   1080
aattgttggg agagatagat gggtagaaga gagtgatatc aagaatttgg tgtatctcca   1140
agcaattgtc aaagaagtat tacgattaca tccacccgca cctttgtcag tgcaaacacct   1200
atctgtagaa gattgtgttg tcaatgggta ccatattcct aaggggactg cactacttac   1260
caatattatg aaactacagc gagatcctca aacatggcca aatcctgata aattcgatcc   1320
agagagattc ctgacgactc atgctactat tgactaccgc gggcagcact atgagtcgat   1380
ccccttggg acgggggagac gagcttgctc cgcgatgaat tattcattgc aagtggaaca   1440
cctttcaatt gctcatatga tccaaggttt cagttttgca actacgacca atgagccttt   1500
ggatatgaaa caaggtgtgg gtttaacttt accaaagaag actgatgttg aagtgctaata   1560
tacacctcgc cttcctccta cgctttatca atattaagat gttttgttgt cgggattcgt   1620
tctgatcaat ccctcaatg                                     1639

```

```

<210> 226
<211> 519
<212> PRT
<213> NICOTIANATABACUM
<400> 226

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```

Met Val Tyr Leu Leu Ser Pro Ile Glu Ala Ile Val Gly Phe Val Thr
1          5          10          15

```

```

Phe Ser Phe Leu Phe Tyr Phe Leu Trp Thr Lys Lys Gln Ser Lys Ile
20          25          30

```

```

Leu Asn Pro Leu Pro Pro Lys Ile Pro Gly Gly Trp Pro Val Ile Gly
35          40          45

```



79601-7270 Sequence Listing v2 -03-25-04.ST25

His Leu Phe Tyr Phe Lys Asn Asn Gly Asp Glu Asp Arg His Phe Ser  
50 55 60

Gln Lys Leu Gly Asp Leu Ala Asp Lys Tyr Gly Pro Val Phe Thr Phe  
65 70 75 80

Arg Leu Gly Phe Arg Arg Phe Leu Ala Val Ser Ser Tyr Glu Ala Met  
85 90 95

Lys Glu Cys Phe Thr Thr Asn Asp Ile His Phe Ala Asp Arg Pro Ser  
100 105 110

Leu Leu Tyr Gly Glu Tyr Leu Cys Tyr Asn Asn Ala Met Leu Ala Val  
115 120 125

Ala Lys Tyr Gly Pro Tyr Trp Lys Lys Asn Arg Lys Leu Val Asn Gln  
130 135 140

Glu Val Leu Ser Val Ser Arg Leu Glu Lys Phe Lys His Val Arg Phe  
145 150 155 160

Ser Ile Ile Gln Lys Asn Ile Lys Gln Leu Tyr Asn Cys Asp Ser Pro  
165 170 175

Met Val Lys Ile Asn Leu Ser Asp Trp Ile Asp Lys Leu Thr Phe Asp  
180 185 190

Ile Ile Leu Lys Met Val Val Gly Lys Asn Tyr Asn Asn Gly His Gly  
195 200 205

Glu Ile Leu Lys Val Ala Phe Gln Lys Phe Met Val Gln Ala Met Glu  
210 215 220

Met Glu Leu Tyr Asp Val Phe His Ile Pro Phe Phe Lys Trp Leu Asp  
225 230 235 240

Leu Thr Gly Asn Ile Lys Ala Met Lys Gln Thr Phe Lys Asp Ile Asp  
245 250 255

Asn Ile Ile Gln Gly Trp Leu Asp Glu His Ile Lys Lys Arg Glu Thr  
260 265 270

Lys Asp Val Gly Gly Glu Asn Glu Gln Asp Phe Ile Asp Val Val Leu  
275 280 285

Ser Lys Met Ser Asp Glu His Leu Gly Glu Gly Tyr Ser His Asp Thr  
Page 165

## 79601-7270 Sequence Listing v2 -03-25-04.ST25

290

295

300

Thr Ile Lys Ala Thr Val Phe Thr Leu Val Leu Asp Ala Thr Asp Thr  
 305 310 315 320

Leu Ala Leu His Ile Lys Trp Val Met Ala Leu Met Ile Asn Asn Lys  
 325 330 335

His Val Met Lys Lys Ala Gln Glu Glu Met Asp Thr Ile Val Gly Arg  
 340 345 350

Asp Arg Trp Val Glu Glu Ser Asp Ile Lys Asn Leu Val Tyr Leu Gln  
 355 360 365

Ala Ile Val Lys Glu Val Leu Arg Leu His Pro Pro Ala Pro Leu Ser  
 370 375 380

Val Gln His Leu Ser Val Glu Asp Cys Val Val Asn Gly Tyr His Ile  
 385 390 395 400

Pro Lys Gly Thr Ala Leu Leu Thr Asn Ile Met Lys Leu Gln Arg Asp  
 405 410 415

Pro Gln Thr Trp Pro Asn Pro Asp Lys Phe Asp Pro Glu Arg Phe Leu  
 420 425 430

Thr Thr His Ala Thr Ile Asp Tyr Arg Gly Gln His Tyr Glu Ser Ile  
 435 440 445

Pro Phe Gly Thr Gly Arg Arg Ala Cys Pro Ala Met Asn Tyr Ser Leu  
 450 455 460

Gln Val Glu His Leu Ser Ile Ala His Met Ile Gln Gly Phe Ser Phe  
 465 470 475 480

Ala Thr Thr Thr Asn Glu Pro Leu Asp Met Lys Gln Gly Val Gly Leu  
 485 490 495

Thr Leu Pro Lys Lys Thr Asp Val Glu Val Leu Ile Thr Pro Arg Leu  
 500 505 510

Pro Pro Thr Leu Tyr Gln Tyr  
 515

&lt;210&gt; 227

&lt;211&gt; 1610

&lt;212&gt; DNA

&lt;213&gt; NICOTIANATABACUM

## 79601-7270 Sequence Listing v2 -03-25-04.ST25

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<400> 227
ctttttctcc ccaaaaaaga gctcatttcc cttgtcccca aaaatggatc ttctcttact    60
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tcgttcaaag cgttttaagc ttccccagg accaatccca gtaccagttt ttggttaattg    180
gcttcaagtt ggtgatgatt taaaccacag aaatcttact gatttttgcca aaaaatttgg    240
tgatcttttc ttgttaagaa tgggccagcg taatttagtt gttgtgtcat ctctgaatt    300
agctaaagaa gttttacaca cacaagggtg tgaatttggg tcaagaacaa gaaatgttgt    360
atgtgatatt ttactggaa aaggtaaga tatggttttt actgtatatg gtgaacactg    420
gagaaaaatg aggagaatta tgactgtacc attttttact aataaagttg tgcagcaata    480
tagagggggg tgggagtttg aagtggcaag tgtaattgag gatgtgaaga aaaatcctga    540
atctgctact aatgggattg tattaaggag gagattacaa ttgatgatgt ataataatat    600
gtttaggatt atgtttgata ggagatttga gagtgaagat gatcctttgt ttgttaagct    660
taaggctttg aatggtgaaa ggagtagatt ggctcagagt ttgagtata attatggtga    720
ttttattccc attttgaggc cttttttgag aggttatttg aagatctgta aagaagttaa    780
ggagaagagg ctgcagcttt tcaaagatta ctttgttgat gaaagaaaga agctttcaaa    840
taccaagagc ttggacagca atgctctgaa atgtgcgatt gatcacattc ttgaggctca    900
acagaagggg gagatcaatg aggacaacgt tctttacatt gttgaaaaca tcaatgttgc    960
tgctatagaa accacattat ggtcaattga gtgggggtatc gccgagttag tcaaccaccc 1020
tcacatccaa aagaaactcc gcgacgagat tgacacagtt cttggcccag gagtgcaagt 1080
gactgaacca gacaccaca agcttcata cttcaggct gtgatcaagg agacgcttcg 1140
tctccgtatg gcaattcctc tattagtccc acacatgaac cttcacgatg caaagcttgg 1200
cgggtttgat attccagcag agagcaaaat cttggttaac gcttggtggc tagctaacaa 1260
cccggctcat tggagaagaa ccgaagagtt cagacccgag aggttcttcg aagaggagaa 1320
gcacgttgag gccaatggca atgacttcag atatcttccg tttggcgttg gtaggaggag 1380
ttgccctgga attatacttg cattgccaat tcttggcatt actttgggac gtttggttca 1440
gaactttgag ctgttgcttc ctccaggcca gtcgaagctc gacaccacag agaaagggtg 1500
acagttcagt ctccatattt tgaagcattc caccattgtg ttgaaaccaa ggtcttgctg 1560
aactttctga tcctaataca ttaaggggtt gaagaaattt tataattatg    1610

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<210> 228
<211> 505
<212> PRT
<213> NICOTIANATABACUM

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<400> 228

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Met Asp Leu Leu Leu Leu Glu Lys Thr Leu Ile Gly Leu Phe Phe Ala  
1 5 10 15  
Ile Leu Ile Ala Ile Ile Val Ser Arg Leu Arg Ser Lys Arg Phe Lys  
20 25 30  
Leu Pro Pro Gly Pro Ile Pro Val Pro Val Phe Gly Asn Trp Leu Gln  
35 40 45  
Val Gly Asp Asp Leu Asn His Arg Asn Leu Thr Asp Phe Ala Lys Lys  
50 55 60  
Phe Gly Asp Leu Phe Leu Leu Arg Met Gly Gln Arg Asn Leu Val Val  
65 70 75 80  
Val Ser Ser Pro Glu Leu Ala Lys Glu Val Leu His Thr Gln Gly Val  
85 90 95  
Glu Phe Gly Ser Arg Thr Arg Asn Val Val Phe Asp Ile Phe Thr Gly  
100 105 110  
Lys Gly Gln Asp Met Val Phe Thr Val Tyr Gly Glu His Trp Arg Lys  
115 120 125  
Met Arg Arg Ile Met Thr Val Pro Phe Phe Thr Asn Lys Val Val Gln  
130 135 140  
Gln Tyr Arg Gly Gly Trp Glu Phe Glu Val Ala Ser Val Ile Glu Asp  
145 150 155 160  
Val Lys Lys Asn Pro Glu Ser Ala Thr Asn Gly Ile Val Leu Arg Arg  
165 170 175  
Arg Leu Gln Leu Met Met Tyr Asn Asn Met Phe Arg Ile Met Phe Asp  
180 185 190  
Arg Arg Phe Glu Ser Glu Asp Asp Pro Leu Phe Val Lys Leu Lys Ala  
195 200 205  
Leu Asn Gly Glu Arg Ser Arg Leu Ala Gln Ser Phe Glu Tyr Asn Tyr  
210 215 220  
Gly Asp Phe Ile Pro Ile Leu Arg Pro Phe Leu Arg Gly Tyr Leu Lys  
225 230 235 240  
Ile Cys Lys Glu Val Lys Glu Lys Arg Leu Gln Leu Phe Lys Asp Tyr  
245 250 255

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Phe Val Asp Glu Arg Lys Lys Leu Ser Asn Thr Lys Ser Leu Asp Ser  
260 265 270

Asn Ala Leu Lys Cys Ala Ile Asp His Ile Leu Glu Ala Gln Gln Lys  
275 280 285

Gly Glu Ile Asn Glu Asp Asn Val Leu Tyr Ile Val Glu Asn Ile Asn  
290 295 300

Val Ala Ala Ile Glu Thr Thr Leu Trp Ser Ile Glu Trp Gly Ile Ala  
305 310 315 320

Glu Leu Val Asn His Pro His Ile Gln Lys Lys Leu Arg Asp Glu Ile  
325 330 335

Asp Thr Val Leu Gly Pro Gly Val Gln Val Thr Glu Pro Asp Thr His  
340 345 350

Lys Leu Pro Tyr Leu Gln Ala Val Ile Lys Glu Thr Leu Arg Leu Arg  
355 360 365

Met Ala Ile Pro Leu Leu Val Pro His Met Asn Leu His Asp Ala Lys  
370 375 380

Leu Gly Gly Phe Asp Ile Pro Ala Glu Ser Lys Ile Leu Val Asn Ala  
385 390 395 400

Trp Trp Leu Ala Asn Asn Pro Ala His Trp Lys Lys Pro Glu Glu Phe  
405 410 415

Arg Pro Glu Arg Phe Phe Glu Glu Glu Lys His Val Glu Ala Asn Gly  
420 425 430

Asn Asp Phe Arg Tyr Leu Pro Phe Gly Val Gly Arg Arg Ser Cys Pro  
435 440 445

Gly Ile Ile Leu Ala Leu Pro Ile Leu Gly Ile Thr Leu Gly Arg Leu  
450 455 460

Val Gln Asn Phe Glu Leu Leu Pro Pro Pro Gly Gln Ser Lys Leu Asp  
465 470 475 480

Thr Thr Glu Lys Gly Gly Gln Phe Ser Leu His Ile Leu Lys His Ser  
485 490 495

Thr Ile Val Leu Lys Pro Arg Ser Cys

<210> 229  
<211> 1595  
<212> DNA  
<213> NICOTIANATABACUM

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<400> 229
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aatttttctg agatgggtat ggaaattctt gaattgggtg tggattcaac caaagaaaaat    120
ggaaaaaaga ctaaaaatgg aaggtttcaa aggaagctca tataagctat tatttggaga      180
tatgaaagaa ataaatacaa tggttgaaga agccaaaacc aagcctatga attttaccaa      240
tgattatgtg gctagagtct tgcctcactt cacaaagttg atgctccaat atggcaagaa      300
tagctttatg tggttagggc caaaaccaac aatgtttatc acagaccctg aactaataag      360
ggagatcttg tcaaaaagtt acatatacca ggagattcaa ggcaatccaa tcactaagtt      420
gctagcacia ggactagtaa gttatgaagc agagaaatgg gctaagcata gaaaaattat      480
caatcctgca tttcaccttg acaagttgaa gcatatgcta ccatcattct acttgagttg      540
ttgtgacatg ctcagaaaaat gggaaagtat agcttcatca gagggatcag aaatagacgt      600
gtggcctttt ctggaaacgt tgacaagcga tgctatttca agaacagctt ttggtagtaa      660
ctatgaagac gggagacaga tatttgagct tcaaaaagaa caagctgagt tgattttaca      720
agcagcgcga tggctttaca tccccggatg gaggtttgtg ccaacaaaga ggaacaagag      780
gatgaagcaa atcgctaaag aagtacgac attagtgttg ggaataatca ataagagaat      840
aagggaaatg aaagcagggg aagctgcaaa agatgactta ctgggaatac tattggaatc      900
taattttcaa gaaatccaaa tgcacggaaa caagaacttt ggcatgacta tcgacgaagt      960
gattgaagag tgcaagttat tttactttgc tgggcaagaa actacttcag ttttgcttgt    1020
ttggactttg attttactga gtaagcatgt cgattggcaa gaaagagcta gagaagaagt    1080
tcatcaagtc tttggaagta acaaacctga ttatgacgca ttgaatcagt tgaaagttgt    1140
aacgatgata ttcaacgagg ttttaagggt gtacccaccg ggaattacca taagtcgaac    1200
tgtacacgag gataccaaat tagggaactt gtcattgcca gcagggatac agcttggtgt    1260
acctgcaatt tggttgcatc atgacaatga aatatgggga gatgatgcaa aggagttcaa    1320
accagagagg tttagtgaag gagttaataa agcaacaaag ggtaaatttg catattttcc    1380
atthagttgg ggaccaagaa tatgtgttgg actgaatttt gcaatgtagg aggcaaaaat    1440
ggcacttgca ttgattctac aacactatgc ttttgagctc tctccatctt atgcacatgc    1500
tcctcataca attatcactc tgcaacctca acatggtgct cctttgattt tgcgcaagct    1560
gtagcgcgga tatattgatt ggttatctac tgtag                                1595

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<210> 230  
 <211> 517  
 <212> PRT  
 <213> NICOTIANATABACUM

<400> 230

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Met Glu Thr Leu Phe Asn Ile Lys Val Ala Val Ser Leu Val Ile Val
1      5      10      15

Ile Ile Phe Leu Arg Trp Val Trp Lys Phe Leu Asn Trp Val Trp Ile
      20      25      30

Gln Pro Lys Lys Met Glu Lys Arg Leu Lys Met Glu Gly Phe Lys Gly
      35      40      45

Ser Ser Tyr Lys Leu Leu Phe Gly Asp Met Lys Glu Ile Asn Thr Met
      50      55      60

Val Glu Glu Ala Lys Thr Lys Pro Met Asn Phe Thr Asn Asp Tyr Val
65      70      75      80

Ala Arg Val Leu Pro His Phe Thr Lys Leu Met Leu Gln Tyr Gly Lys
      85      90      95

Asn Ser Phe Met Trp Leu Gly Pro Lys Pro Thr Met Phe Ile Thr Asp
      100     105     110

Pro Glu Leu Ile Arg Glu Ile Leu Ser Lys Ser Tyr Ile Tyr Gln Glu
      115     120     125

Ile Gln Gly Asn Pro Ile Thr Lys Leu Leu Ala Gln Gly Leu Val Ser
      130     135     140

Tyr Glu Ala Glu Lys Trp Ala Lys His Arg Lys Ile Ile Asn Pro Ala
145     150     155     160

Phe His Leu Asp Lys Leu Lys His Met Leu Pro Ser Phe Tyr Leu Ser
      165     170     175

Cys Cys Asp Met Leu Arg Lys Trp Glu Ser Ile Ala Ser Ser Glu Gly
      180     185     190

Ser Glu Ile Asp Val Trp Pro Phe Leu Glu Thr Leu Thr Ser Asp Ala
      195     200     205

Ile Ser Arg Thr Ala Phe Gly Ser Asn Tyr Glu Asp Gly Arg Gln Ile
      210     215     220

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79601-7270 Sequence Listing v2 -03-25-04.ST25

Phe Glu Leu Gln Lys Glu Gln Ala Glu Leu Ile Leu Gln Ala Ala Arg  
225 230 235 240

Trp Leu Tyr Ile Pro Gly Trp Arg Phe Val Pro Thr Lys Arg Asn Lys  
245 250 255

Arg Met Lys Gln Ile Ala Lys Glu Val Arg Ser Leu Val Leu Gly Ile  
260 265 270

Ile Asn Lys Arg Ile Arg Glu Met Lys Ala Gly Glu Ala Ala Lys Asp  
275 280 285

Asp Leu Leu Gly Ile Leu Leu Glu Ser Asn Phe Lys Glu Ile Gln Met  
290 295 300

His Gly Asn Lys Asn Phe Gly Met Thr Ile Asp Glu Val Ile Glu Glu  
305 310 315 320

Cys Lys Leu Phe Tyr Phe Ala Gly Gln Glu Thr Thr Ser Val Leu Leu  
325 330 335

Val Trp Thr Leu Ile Leu Leu Ser Lys His Val Asp Trp Gln Glu Arg  
340 345 350

Ala Arg Glu Glu Val His Gln Val Phe Gly Ser Asn Lys Pro Asp Tyr  
355 360 365

Asp Ala Leu Asn Gln Leu Lys Val Val Thr Met Ile Phe Asn Glu Val  
370 375 380

Leu Arg Leu Tyr Pro Pro Gly Ile Thr Ile Ser Arg Thr Val His Glu  
385 390 395 400

Asp Thr Lys Leu Gly Asn Leu Ser Leu Pro Ala Gly Ile Gln Leu Val  
405 410 415

Leu Pro Ala Ile Trp Leu His His Asp Asn Glu Ile Trp Gly Asp Asp  
420 425 430

Ala Lys Glu Phe Lys Pro Glu Arg Phe Ser Glu Gly Val Asn Lys Ala  
435 440 445

Thr Lys Gly Lys Phe Ala Tyr Phe Pro Phe Ser Trp Gly Pro Arg Ile  
450 455 460

Cys Val Gly Leu Asn Phe Ala Met Leu Glu Ala Lys Met Ala Leu Ala  
465 470 475 480



## 79601-7270 Sequence Listing v2 -03-25-04.ST25

Leu Ile Leu Gln His Tyr Ala Phe Glu Leu Ser Pro Ser Tyr Ala His  
 485 490 495

Ala Pro His Thr Ile Ile Thr Leu Gln Pro Gln His Gly Ala Pro Leu  
 500 505 510

Ile Leu Arg Lys Leu  
 515

<210> 231  
 <211> 1673  
 <212> DNA  
 <213> NICOTIANATABACUM

<400> 231  
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 ccattttcct atttctatct ttctctcttt tggttaaggat atggaagaac tccaatagcc 120  
 aaagcaaaaa gttgccacca ggtccatgga aactaccaat actaggaagt atgcttcata 180  
 tggttggtgg actaccacac catgtcctta gagatttagc caaaaaatat ggaccactta 240  
 tgcaccttca attaggtgaa gtttctgcgg ttgtgggttac ttctcctgat acggcaaaaag 300  
 aagtattaaa aactcatgac atcgcttttg cgtctaggcc tagccttttg gccccggaga 360  
 ttgtctgtta caataggctt gatctagcct ttgtccccta tggcgactat tggagacaaa 420  
 tgcgtaaaat atgtgtcttg gaagtgtcga gtgccaagaa tgttcggaca tttagctcta 480  
 ttaggcggaa tgaagttctt cgtctcatta attttatccg gtcattctt ggtgaacctta 540  
 ttaatgttac ggaaaggatc tttttgttca caagctccat gacatgtaga tcagcgtttg 600  
 ggcaagtgtt caaagagcaa gacaaattta tacaactaat taaagaagt atactcttag 660  
 caggaggggt tgatgtggct gacatattcc cttcactgaa gtttcttcat gtgctcagt 720  
 gaatgaagg taagattatg aatgcacacc ataaggtaga tgccattgtt gagaatgtca 780  
 tcaatgagca caagaaaaat cttgcaattg ggaaaactaa tggagcgta ggaggtgaag 840  
 atttaattga tgttcttcta agacttatga atgatggagg ctttcaattt cctatcacca 900  
 acgacaacat caaagccata atttttgaca tgtttgctgc cgggacagag acttcatcgt 960  
 caacaattgt gtgggctatg gtagaaatgg tgaaaaatcc agccgtattc gcgaaagctc 1020  
 aagcagaagt aagagaagca tttagaggaa aagaaacttt cgatgaaaat gatgtggagg 1080  
 agctaaacta cctaaagtta gtaataaaaag aaactctaag acttcatcca ccggttccac 1140  
 ttttgctccc aagagaatgt agggaagaga caaatataaa cggctacact attcctgtaa 1200  
 agaccaaagt catggttaat gtttgggctt tgggaagaga tccaaaatat tggaatgacg 1260  
 cagaaacttt tatgccagag agatttgagc agtgctctaa ggattttgtt ggtaataatt 1320

79601-7270 Sequence Listing v2 -03-25-04.ST25

ttgaatatct tccatttggg ggcggaagga ggatttgtcc tgggatttcg tttggcttag	1380
ctaattgctta tttgccattg gctcaattac tatatcactt cgatttgaaa ctccctgctg	1440
gaatcgaacc aagcgacttg gacttgactg agttgggttg agtaactgcc gctagaaaaa	1500
gtgaccttta cttgggttgcg actccttatt aacctcctca aaagtgattt aatggtttca	1560
agtttttatt tcctagcaaa cccactatt gtcctatctt tcttttgggtg ttttcggttt	1620
tatctactct aatacatgca tcttttacca tataggaatg taccatgttg tcg	1673

<210> 232  
 <211> 514  
 <212> PRT  
 <213> NICOTIANATABACUM

<400> 232

Met	Gln	Leu	Arg	Phe	Glu	Glu	Tyr	Gln	Leu	Thr	Lys	Met	Gln	Phe	Phe
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Ser	Leu	Val	Ser	Ile	Phe	Leu	Phe	Leu	Ser	Phe	Leu	Phe	Leu	Leu	Arg
			20					25					30		

Ile	Trp	Lys	Asn	Ser	Asn	Ser	Gln	Ser	Lys	Lys	Leu	Pro	Pro	Gly	Pro
		35					40					45			

Trp	Lys	Leu	Pro	Ile	Leu	Gly	Ser	Met	Leu	His	Met	Val	Gly	Gly	Leu
	50					55					60				

Pro	His	His	Val	Leu	Arg	Asp	Leu	Ala	Lys	Lys	Tyr	Gly	Pro	Leu	Met
65					70					75					80

His	Leu	Gln	Leu	Gly	Glu	Val	Ser	Ala	Val	Val	Val	Thr	Ser	Pro	Asp
			85						90					95	

Thr	Ala	Lys	Glu	Val	Leu	Lys	Thr	His	Asp	Ile	Ala	Phe	Ala	Ser	Arg
			100					105					110		

Pro	Ser	Leu	Leu	Ala	Pro	Glu	Ile	Val	Cys	Tyr	Asn	Arg	Ser	Asp	Leu
		115					120					125			

Ala	Phe	Cys	Pro	Tyr	Gly	Asp	Tyr	Trp	Arg	Gln	Met	Arg	Lys	Ile	Cys
	130					135					140				

Val	Leu	Glu	Val	Leu	Ser	Ala	Lys	Asn	Val	Arg	Thr	Phe	Ser	Ser	Ile
145					150					155					160

Arg	Arg	Asn	Glu	Val	Leu	Arg	Leu	Ile	Asn	Phe	Ile	Arg	Ser	Ser	Ser
				165					170					175	

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Gly Glu Pro Ile Asn Val Thr Glu Arg Ile Phe Leu Phe Thr Ser Ser  
180 185 190

Met Thr Cys Arg Ser Ala Phe Gly Gln Val Phe Lys Glu Gln Asp Lys  
195 200 205

Phe Ile Gln Leu Ile Lys Glu Val Ile Leu Leu Ala Gly Gly Phe Asp  
210 215 220

Val Ala Asp Ile Phe Pro Ser Leu Lys Phe Leu His Val Leu Ser Gly  
225 230 235 240

Met Lys Gly Lys Ile Met Asn Ala His His Lys Val Asp Ala Ile Val  
245 250 255

Glu Asn Val Ile Asn Glu His Lys Lys Asn Leu Ala Ile Gly Lys Thr  
260 265 270

Asn Gly Ala Leu Gly Gly Glu Asp Leu Ile Asp Val Leu Leu Arg Leu  
275 280 285

Met Asn Asp Gly Gly Leu Gln Phe Pro Ile Thr Asn Asp Asn Ile Lys  
290 295 300

Ala Ile Ile Phe Asp Met Phe Ala Ala Gly Thr Glu Thr Ser Ser Ser  
305 310 315 320

Thr Ile Val Trp Ala Met Val Glu Met Val Lys Asn Pro Ala Val Phe  
325 330 335

Ala Lys Ala Gln Ala Glu Val Arg Glu Ala Phe Arg Gly Lys Glu Thr  
340 345 350

Phe Asp Glu Asn Asp Val Glu Glu Leu Asn Tyr Leu Lys Leu Val Ile  
355 360 365

Lys Glu Thr Leu Arg Leu His Pro Pro Val Pro Leu Leu Leu Pro Arg  
370 375 380

Glu Cys Arg Glu Glu Thr Asn Ile Asn Gly Tyr Thr Ile Pro Val Lys  
385 390 395 400

Thr Lys Val Met Val Asn Val Trp Ala Leu Gly Arg Asp Pro Lys Tyr  
405 410 415

Trp Asn Asp Ala Glu Thr Phe Met Pro Glu Arg Phe Glu Gln Cys Ser  
Page 175

Lys Asp Phe Val Gly Asn Asn Phe Glu Tyr Leu Pro Phe Gly Gly Gly  
435 440 445

Arg Arg Ile Cys Pro Gly Ile Ser Phe Gly Leu Ala Asn Ala Tyr Leu  
450 455 460

Pro Leu Ala Gln Leu Leu Tyr His Phe Asp Trp Lys Leu Pro Ala Gly  
465 470 475 480

Ile Glu Pro Ser Asp Leu Asp Leu Thr Glu Leu Val Gly Val Thr Ala  
485 490 495

Ala Arg Lys Ser Asp Leu Tyr Leu Val Ala Thr Pro Tyr Gln Pro Pro  
500 505 510

Gln Lys

<210> 233  
<211> 1601  
<212> DNA  
<213> NICOTIANATABACUM

<400> 233  
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ctaattgagga taagcaaagc aaaaaagctc cctccagggtc caaggaaaact gcctataata 180  
ggaaaccttc atcaaattgg aaaattacct catcgttcac ttcaaaaaact ttctaattgaa 240  
tatggggatt tcattttctt gcaattaggt tctgtaccga ctgtgggtgt ctctcagct 300  
gacattgccc gagagatctt tagaactcac gaccttgttt tctcaggccg tcctgcttta 360  
tatgctgcca gaaaactttc ctacaattgc tacaacgttt catttgcacc ctatggtaat 420  
tactggagag aggctcggaa aattctagtgt ttggagttgc taagtacaaa gagagtacaa 480  
agtttcgagg caattcgaga cgaggaagta agtagcttgg ttcaaattat ctgtagttcc 540  
ttgagctcac ctgttaacat aagcacatta gcactatcct tggcaaataa cgttgtttgt 600  
cgagtggcctt ttgggaaagg gagtgtgtaa ggaggaaatg attatgagga taggaagttt 660  
aatgaaattc tatatgagac acaagaatta ttgggtgagt ttaacgttgc tgattatattt 720  
cctcggtatg catggattaa caaaataaat ggggtttgatg aacgattgga aaataatttt 780  
aggggaattgg ataagtttta tgacaaagta atagaagatc atcttaattc atgtagctgg 840  
atgaaacaaa gggatgatga agacgttatt gatgtattgc ttcgaattca aaaggatcca 900

## 79601-7270 Sequence Listing v2 -03-25-04.ST25

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ccaagagtct tgagaaaagc tcaagaggaa gttagagaag tttctaaggg aaaacaaaag 1080
gtccaagaaa gtgatctttg caaactagat tacttgaaat tggatcatcaa agaaaccttt 1140
agactacacc caccagtccc attactagtc cctcgagtaa caacagccag ctgcaaaata 1200
atggaatacg aaattccagt aaatacaaga gtcttcatca acgcgacagc aaatgggaca 1260
aatccaaaat actgggaaaa tccattgaca ttcttgccag agagattctt ggataaggag 1320
attgattaca gaggcaaaaa ttttgagttg ttgccatttg gggcagggag aagaggggtgt 1380
ccaggaatta atttttcaat accacttggt gagcttgcac ttgctaattct attgtttcat 1440
tataattggg cacttcctga agggatgcta gctaaggatg ttgatatgga agaagctttg 1500
gggattacca tgcacaagaa atctcccctt tgcttagtag cttctcatta tacttgttga 1560
gattttaaaa gatttttagca tagctatata tagcttgaag t 1601

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<210> 234  
 <211> 494  
 <212> PRT  
 <213> NICOTIANATABACUM

<400> 234

Met Asn Phe Leu Val Val Leu Ala Ser Leu Phe Leu Phe Val Phe Leu  
 1 5 10 15

Met Arg Ile Ser Lys Ala Lys Lys Leu Pro Pro Gly Pro Arg Lys Leu  
 20 25 30

Pro Ile Ile Gly Asn Leu His Gln Ile Gly Lys Leu Pro His Arg Ser  
 35 40 45

Leu Gln Lys Leu Ser Asn Glu Tyr Gly Asp Phe Ile Phe Leu Gln Leu  
 50 55 60

Gly Ser Val Pro Thr Val Val Val Ser Ser Ala Asp Ile Ala Arg Glu  
 65 70 75 80

Ile Phe Arg Thr His Asp Leu Val Phe Ser Gly Arg Pro Ala Leu Tyr  
 85 90 95

Ala Ala Arg Lys Leu Ser Tyr Asn Cys Tyr Asn Val Ser Phe Ala Pro  
 100 105 110

Tyr Gly Asn Tyr Trp Arg Glu Ala Arg Lys Ile Leu Val Leu Glu Leu  
 115 120 125

## 79601-7270 Sequence Listing v2 -03-25-04.ST25

Leu Ser Thr Lys Arg Val Gln Ser Phe Glu Ala Ile Arg Asp Glu Glu  
 130 135 140  
 Val Ser Ser Leu Val Gln Ile Ile Cys Ser Ser Leu Ser Ser Pro Val  
 145 150 155 160  
 Asn Ile Ser Thr Leu Ala Leu Ser Leu Ala Asn Asn Val Val Cys Arg  
 165 170 175  
 Val Ala Phe Gly Lys Gly Ser Ala Glu Gly Gly Asn Asp Tyr Glu Asp  
 180 185 190  
 Arg Lys Phe Asn Glu Ile Leu Tyr Glu Thr Gln Glu Leu Leu Gly Glu  
 195 200 205  
 Phe Asn Val Ala Asp Tyr Phe Pro Arg Met Ala Trp Ile Asn Lys Ile  
 210 215 220  
 Asn Gly Phe Asp Glu Arg Leu Glu Asn Asn Phe Arg Glu Leu Asp Lys  
 225 230 235 240  
 Phe Tyr Asp Lys Val Ile Glu Asp His Leu Asn Ser Cys Ser Trp Met  
 245 250 255  
 Lys Gln Arg Asp Asp Glu Asp Val Ile Asp Val Leu Leu Arg Ile Gln  
 260 265 270  
 Lys Asp Pro Ser Gln Glu Ile Pro Leu Lys Asp Asp His Ile Lys Gly  
 275 280 285  
 Leu Leu Ala Asp Ile Phe Ile Ala Gly Thr Asp Thr Ser Ser Thr Thr  
 290 295 300  
 Ile Glu Trp Ala Met Ser Glu Leu Ile Lys Asn Pro Arg Val Leu Arg  
 305 310 315 320  
 Lys Ala Gln Glu Glu Val Arg Glu Val Ser Lys Gly Lys Gln Lys Val  
 325 330 335  
 Gln Glu Ser Asp Leu Cys Lys Leu Asp Tyr Leu Lys Leu Val Ile Lys  
 340 345 350  
 Glu Thr Phe Arg Leu His Pro Pro Val Pro Leu Leu Val Pro Arg Val  
 355 360 365  
 Thr Thr Ala Ser Cys Lys Ile Met Glu Tyr Glu Ile Pro Val Asn Thr  
 370 375 380

79601-7270 Sequence Listing v2 -03-25-04.ST25

Arg Val Phe Ile Asn Ala Thr Ala Asn Gly Thr Asn Pro Lys Tyr Trp  
385 390 395 400

Glu Asn Pro Leu Thr Phe Leu Pro Glu Arg Phe Leu Asp Lys Glu Ile  
405 410 415

Asp Tyr Arg Gly Lys Asn Phe Glu Leu Leu Pro Phe Gly Ala Gly Arg  
420 425 430

Arg Gly Cys Pro Gly Ile Asn Phe Ser Ile Pro Leu Val Glu Leu Ala  
435 440 445

Leu Ala Asn Leu Leu Phe His Tyr Asn Trp Ser Leu Pro Glu Gly Met  
450 455 460

Leu Ala Lys Asp Val Asp Met Glu Glu Ala Leu Gly Ile Thr Met His  
465 470 475 480

Lys Lys Ser Pro Leu Cys Leu Val Ala Ser His Tyr Thr Cys  
485 490

<210> 235  
<211> 1570  
<212> DNA  
<213> NICOTIANATABACUM

<400> 235  
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gcttccgta atcggtcact tccacaaact aggcttaca cctcaccgtt ctctacaaaa 180  
actatcaaat gaacatggtc ccatgatgat gcttcaattc ggtagcgtag ctgtgcttat 240  
cgcttcatca gctgaagctg cttccgaaat catgaaaacc caagatttgt cttttgcaaa 300  
caaaccatt tcaaccattc ctagcaagct tttcttcggc ccaaaggacg ttgccttcac 360  
cccatatggg gattactgga ggaatgccag aagcatttgc atgcttcagc ttttgaacaa 420  
caaaagagtc cagtcttttc gaaagataag ggaagaagag acttctcttc ttctccagag 480  
gattagggaa tcgcaaatt cagaagtcga ttaacggag ctgttcgtt ccatgactaa 540  
cgacatagtt tgcaggggtg ccttaggaag gaagtattgt gatggggaag aaggaggagaa 600  
attcaagtct ttgctgttag agtttgtgga attgttggga gtttttaaca ttggagatta 660  
catgccgtgg cttgcatgga tgaatcgtt caatggtttg aatgccaaag tggataaagt 720  
ggcgaaagag tttgatgcat ttttgaggga tgtgattgag gaacacggag gaaataagaa 780  
atcagacact gaagctgaag gggcagactt cgtggatata ttattgcagg ttcacaaaaga 840

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```

aaacaaggct ggttttcaag tcgaaatgga tgcaatcaaa gctattatca tggatatgtt 900
tgctgcggga acagatacaa cttccacgct tctagagtgg acaatgaacg agctcttaag 960
aaatccaaaa acattgaata agttgagaga tgaggtagaga caagtgactc aagggaagac 1020
agaggtaaca gaggatgact tagagaaaat gccgtattta agagcagcag ttaaggagag 1080
ttccaggcta cactctccag tgccacttct acctcgagaa gcaattaagg atgcaaaggt 1140
tttgggctac gatatagctg cagggactca agtcctcggt tgtccatggg caatctcaag 1200
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atgcttggtgta 1570

```

<210> 236  
 <211> 494  
 <212> PRT  
 <213> NICOTIANATABACUM

<400> 236

Met Ser Val Phe Ala Val Ile Ser Phe Phe Leu Leu Leu Phe Phe Leu  
 1 5 10 15

Phe Lys Ser Tyr Leu Pro Ser Ser Lys Thr Lys Lys Asn Ser Pro Pro  
 20 25 30

Ser Pro Ser Lys Leu Pro Leu Ile Gly His Phe His Lys Leu Gly Leu  
 35 40 45

Gln Pro His Arg Ser Leu Gln Lys Leu Ser Asn Glu His Gly Pro Met  
 50 55 60

Met Met Leu Gln Phe Gly Ser Val Pro Val Leu Ile Ala Ser Ser Ala  
 65 70 75 80

Glu Ala Ala Ser Glu Ile Met Lys Thr Gln Asp Leu Ser Phe Ala Asn  
 85 90 95

Lys Pro Ile Ser Thr Ile Pro Ser Lys Leu Phe Phe Gly Pro Lys Asp  
 100 105 110



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Val Ala Phe Thr Pro Tyr Gly Asp Tyr Trp Arg Asn Ala Arg Ser Ile  
 115 120 125  
 Cys Met Leu Gln Leu Leu Asn Asn Lys Arg Val Gln Ser Phe Arg Lys  
 130 135 140  
 Ile Arg Glu Glu Glu Thr Ser Leu Leu Leu Gln Arg Ile Arg Glu Ser  
 145 150 155 160  
 Pro Asn Ser Glu Val Asp Leu Thr Glu Leu Phe Val Ser Met Thr Asn  
 165 170 175  
 Asp Ile Val Cys Arg Val Ala Leu Gly Arg Lys Tyr Cys Asp Gly Glu  
 180 185 190  
 Glu Gly Arg Lys Phe Lys Ser Leu Leu Leu Glu Phe Val Glu Leu Leu  
 195 200 205  
 Gly Val Phe Asn Ile Gly Asp Tyr Met Pro Trp Leu Ala Trp Met Asn  
 210 215 220  
 Arg Phe Asn Gly Leu Asn Ala Lys Val Asp Lys Val Ala Lys Glu Phe  
 225 230 235 240  
 Asp Ala Phe Leu Glu Asp Val Ile Glu Glu His Gly Gly Asn Lys Lys  
 245 250 255  
 Ser Asp Thr Glu Ala Glu Gly Ala Asp Phe Val Asp Ile Leu Leu Gln  
 260 265 270  
 Val His Lys Glu Asn Lys Ala Gly Phe Gln Val Glu Met Asp Ala Ile  
 275 280 285  
 Lys Ala Ile Ile Met Asp Met Phe Ala Ala Gly Thr Asp Thr Thr Ser  
 290 295 300  
 Thr Leu Leu Glu Trp Thr Met Asn Glu Leu Leu Arg Asn Pro Lys Thr  
 305 310 315 320  
 Leu Asn Lys Leu Arg Asp Glu Val Arg Gln Val Thr Gln Gly Lys Thr  
 325 330 335  
 Glu Val Thr Glu Asp Asp Leu Glu Lys Met Pro Tyr Leu Arg Ala Ala  
 340 345 350  
 Val Lys Glu Ser Ser Arg Leu His Ser Pro Val Pro Leu Leu Pro Arg  
 355 360 365

79601-7270 Sequence Listing v2 -03-25-04.ST25

Glu Ala Ile Lys Asp Ala Lys Val Leu Gly Tyr Asp Ile Ala Ala Gly  
370 375 380

Thr Gln Val Leu Val Cys Pro Trp Ala Ile Ser Arg Asp Pro Asn Leu  
385 390 395 400

Trp Glu Asn Pro Glu Glu Phe Gln Pro Glu Arg Phe Leu Asp Thr Ser  
405 410 415

Ile Asp Tyr Lys Gly Leu His Phe Glu Leu Ile Pro Phe Gly Ala Gly  
420 425 430

Arg Arg Gly Cys Pro Gly Ile Thr Phe Ala Lys Phe Val Asn Glu Leu  
435 440 445

Ala Leu Ala Arg Leu Met Phe His Phe Asp Phe Ser Leu Pro Lys Gly  
450 455 460

Val Lys His Glu Asp Leu Asp Val Glu Glu Ala Ala Gly Ile Thr Val  
465 470 475 480

Arg Arg Lys Phe Pro Leu Leu Ala Val Ala Thr Pro Cys Ser  
485 490

<210> 237  
<211> 1585  
<212> DNA  
<213> NICOTIANATABACUM

<400> 237  
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cattagcttt tctctgtaaa ataatcacct gtcgaagacc ggtaaccgg aaaataccac 120  
caggtccaaa accatggccc atcattggca atttgaacct acttggctcct ataccacatc 180  
aatcttttga cttgctttcc aaaaaatatg gagagttagt gctgctgaaa tttggctcca 240  
ggccagttct tgttgcttca tctgctgaaa tggcaaaaca gtttttaaaa gtacatgatg 300  
ctaatttcgc ctcccgtcct atgctagctg gtggaaagta tacaagctat aactattgtg 360  
acatgacatg ggcaccctat ggtccctatt ggcgccaagc acgacgaatt taccttaacc 420  
agatatttac tccgaaaagg ctagactcgt tcgagtacat tcgtgttgaa gaaaggcagg 480  
ccttgatttc ccagctgaat tcccttgctg gaaagccatt ttttctcaaa gaccatttgt 540  
cgcgatttag cctctgcagc atgacaagga tggttttgag caacaagtac tttgggtgaat 600  
caacagttag agtagaagat ttgcagtacc tggtagatca atggttctta cttaatgggtg 660  
ctttcaacat tggagattgg attccatggc tcagcttctt ggacctacaa ggctatgtga 720

## 79601-7270 Sequence Listing v2 -03-25-04.ST25

```

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gcagggctaa gaagaatgca gagaagaact ttgtcccaaa agacatgggt gatgtcttgt 840
tgaagatggc tgaagatcct aatctggaag tcaaactcac taatgactgt gtcaaaggggt 900
taatgcagga ttactaact ggaggaacag atagcttaac agcagcagtg caatgggcat 960
ttcaagaact tcttagacgg ccaaggggta ttgagaaggc aaccgaagag cttgaccgga 1020
ttgtcgggaa agagagatgg gtagaagaga aagattgctc gcagctatct tacgttgaag 1080
caatcctcaa ggaaacacta aggttacatc ctctaggaac tatgctagca ccgcattgtg 1140
ctatagaaga ttgtaacgtg gctgggtatg acatacagaa aggaacgacc gttctgggtga 1200
atgtttggac cattggaagg gacccaaaat actgggatag agcacaagag tttctccccg 1260
agagattctt agagaacgac attgatatgg acggacataa ctttgctttc ttgccatttg 1320
gctcggggcg aaggagggtg cctggctata gccttggtgact taagggttatc cgagtaacat 1380
tagccaacat gttgcatgga ttcaactgga aattacctga aggtatgaag ccagaagata 1440
taagtgtgga agaacattat gggctcacta cacatcctaa gtttcctggt cctgtgatct 1500
tggaatctag actttcttca gatctctatt ccccatcac ttaatcctaa gtgcttccta 1560
ttatagcatc atatcaatat ccctc 1585

```

&lt;210&gt; 238

&lt;211&gt; 508

&lt;212&gt; PRT

&lt;213&gt; NICOTIANATABACUM

&lt;400&gt; 238

```

Met Glu Asn Ser Trp Val Phe Leu Ala Leu Ala Gly Leu Ser Ala Leu
1           5           10          15

```

```

Ala Phe Leu Cys Lys Ile Ile Thr Cys Arg Arg Pro Val Asn Arg Lys
20          25          30

```

```

Ile Pro Pro Gly Pro Lys Pro Trp Pro Ile Ile Gly Asn Leu Asn Leu
35          40          45

```

```

Leu Gly Pro Ile Pro His Gln Ser Phe Asp Leu Leu Ser Lys Lys Tyr
50          55          60

```

```

Gly Glu Leu Met Leu Leu Lys Phe Gly Ser Arg Pro Val Leu Val Ala
65          70          75          80

```

```

Ser Ser Ala Glu Met Ala Lys Gln Phe Leu Lys Val His Asp Ala Asn
85          90          95

```

```

Phe Ala Ser Arg Pro Met Leu Ala Gly Gly Lys Tyr Thr Ser Tyr Asn

```

## 79601-7270 Sequence Listing v2 -03-25-04.ST25

100

105

110

Tyr Cys Asp Met Thr Trp Ala Pro Tyr Gly Pro Tyr Trp Arg Gln Ala  
 115 120 125

Arg Arg Ile Tyr Leu Asn Gln Ile Phe Thr Pro Lys Arg Leu Asp Ser  
 130 135 140

Phe Glu Tyr Ile Arg Val Glu Glu Arg Gln Ala Leu Ile Ser Gln Leu  
 145 150 155 160

Asn Ser Leu Ala Gly Lys Pro Phe Phe Leu Lys Asp His Leu Ser Arg  
 165 170 175

Phe Ser Leu Cys Ser Met Thr Arg Met Val Leu Ser Asn Lys Tyr Phe  
 180 185 190

Gly Glu Ser Thr Val Arg Val Glu Asp Leu Gln Tyr Leu Val Asp Gln  
 195 200 205

Trp Phe Leu Leu Asn Gly Ala Phe Asn Ile Gly Asp Trp Ile Pro Trp  
 210 215 220

Leu Ser Phe Leu Asp Leu Gln Gly Tyr Val Lys Gln Met Lys Ala Leu  
 225 230 235 240

Lys Arg Thr Phe Asp Lys Phe His Asn Ile Val Leu Asp Asp Arg Arg  
 245 250 255

Ala Lys Lys Asn Ala Glu Lys Asn Phe Val Pro Lys Asp Met Val Asp  
 260 265 270

Val Leu Leu Lys Met Ala Glu Asp Pro Asn Leu Glu Val Lys Leu Thr  
 275 280 285

Asn Asp Cys Val Lys Gly Leu Met Gln Asp Leu Leu Thr Gly Gly Thr  
 290 295 300

Asp Ser Leu Thr Ala Ala Val Gln Trp Ala Phe Gln Glu Leu Leu Arg  
 305 310 315 320

Arg Pro Arg Val Ile Glu Lys Ala Thr Glu Glu Leu Asp Arg Ile Val  
 325 330 335

Gly Lys Glu Arg Trp Val Glu Glu Lys Asp Cys Ser Gln Leu Ser Tyr  
 340 345 350

79601-7270 Sequence Listing v2 -03-25-04.ST25

Val Glu Ala Ile Leu Lys Glu Thr Leu Arg Leu His Pro Leu Gly Thr  
355 360 365

Met Leu Ala Pro His Cys Ala Ile Glu Asp Cys Asn Val Ala Gly Tyr  
370 375 380

Asp Ile Gln Lys Gly Thr Thr Val Leu Val Asn Val Trp Thr Ile Gly  
385 390 395 400

Arg Asp Pro Lys Tyr Trp Asp Arg Ala Gln Glu Phe Leu Pro Glu Arg  
405 410 415

Phe Leu Glu Asn Asp Ile Asp Met Asp Gly His Asn Phe Ala Phe Leu  
420 425 430

Pro Phe Gly Ser Gly Arg Arg Arg Cys Pro Gly Tyr Ser Leu Gly Leu  
435 440 445

Lys Val Ile Arg Val Thr Leu Ala Asn Met Leu His Gly Phe Asn Trp  
450 455 460

Lys Leu Pro Glu Gly Met Lys Pro Glu Asp Ile Ser Val Glu Glu His  
465 470 475 480

Tyr Gly Leu Thr Thr His Pro Lys Phe Pro Val Pro Val Ile Leu Glu  
485 490 495

Ser Arg Leu Ser Ser Asp Leu Tyr Ser Pro Ile Thr  
500 505

<210> 239  
<211> 1591  
<212> DNA  
<213> NICOTIANATABACUM

<400> 239  
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ctgcattagc ttttctctgt aaaataatca cctgtcgaag accggttaac cggaaaatac 120  
caccaggtcc aaaaccatgg cccatcattg gcaatttgaa cctacttggt cctataccac 180  
atcaatcttt tgacttgctt tccaaaaaat atggagagtt gatgctgctg aaatttggct 240  
ccaggccagt tcttgttgct tcatctgctg aaatggcaaa acagttttta aaagtacatg 300  
atgctaattt cgcctcccgt cctatgctag ctgggtggaaa gtatacaagc tataactatt 360  
gtgacatgac atgggcaccc tatggtccct attggcgcca agcacgacga cgaatttacc 420  
ttaaccagat atttactccg aaaaggctag actcgttcga gtacattcgt gttgaagaaa 480  
ggcaggcctt gatttcccag ctgaattccc ttgctggaaa gccatttttt ctcaaagacc 540

79601-7270 Sequence Listing v2 -03-25-04.ST25

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gtgaatcaac agttagagta gaagatttgc agtacctggg agatcaatgg ttcttactta 660
atgggtgctt caacattgga gattggattc catggctcag cttcttggac ctacaaggct 720
atgtgaaaca aatgaaggct ttgaaaagaa cttttgataa gttccacaac attgtgctag 780
atgatcacag ggctaagaag aatgcagaga agaactttgt cccaaaagac atgggtgatg 840
tcttgttgaa gatggctgaa gatcctaatt tggaagtcaa actcactaat gactgtgtca 900
aaggggtaat gcaggattta ctaactggag gaacagatag cttaacagca gcagtgcaat 960
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attgtgctat agaagattgt aacgtggctg gttatgacat acagaaaagga acgaccgttc 1200
tggtgaatgt ttggaccatt ggaagggacc caaaatactg ggatagagca caagagtttc 1260
tccccgagag attcttagag aacgacattg atatggacgg acataacttt gctttcttgc 1320
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taacattagc caacatgttg catggattca actggaaatt acctgaagggt atgaagccag 1440
aagatataag tgtggaagaa cattatgggc tcactacaca tcctaagttt cctgttcctg 1500
tgatcttggg atctagactt tcttcagatc tctattcccc catcacttaa tcctaagtgc 1560
ttcctattat agcatcatat caatatccct c 1591

```

<210> 240  
 <211> 509  
 <212> PRT  
 <213> NICOTIANATABACUM

<400> 240

```

Met Glu Asn Ser Trp Val Phe Leu Ala Leu Ala Gly Leu Ser Ala Leu
1           5           10          15
Ala Phe Leu Cys Lys Ile Ile Thr Cys Arg Arg Pro Val Asn Arg Lys
20          25          30
Ile Pro Pro Gly Pro Lys Pro Trp Pro Ile Ile Gly Asn Leu Asn Leu
35          40          45
Leu Gly Pro Ile Pro His Gln Ser Phe Asp Leu Leu Ser Lys Lys Tyr
50          55          60
Gly Glu Leu Met Leu Leu Lys Phe Gly Ser Arg Pro Val Leu Val Ala
65          70          75          80

```

79601-7270 Sequence Listing v2 -03-25-04.ST25

Ser Ser Ala Glu Met Ala Lys Gln Phe Leu Lys Val His Asp Ala Asn  
85 90 95

Phe Ala Ser Arg Pro Met Leu Ala Gly Gly Lys Tyr Thr Ser Tyr Asn  
100 105 110

Tyr Cys Asp Met Thr Trp Ala Pro Tyr Gly Pro Tyr Trp Arg Gln Ala  
115 120 125

Arg Arg Arg Ile Tyr Leu Asn Gln Ile Phe Thr Pro Lys Arg Leu Asp  
130 135 140

Ser Phe Glu Tyr Ile Arg Val Glu Glu Arg Gln Ala Leu Ile Ser Gln  
145 150 155 160

Leu Asn Ser Leu Ala Gly Lys Pro Phe Phe Leu Lys Asp His Leu Ser  
165 170 175

Arg Phe Ser Leu Cys Ser Met Thr Arg Met Val Leu Ser Asn Lys Tyr  
180 185 190

Phe Gly Glu Ser Thr Val Arg Val Glu Asp Leu Gln Tyr Leu Val Asp  
195 200 205

Gln Trp Phe Leu Leu Asn Gly Ala Phe Asn Ile Gly Asp Trp Ile Pro  
210 215 220

Trp Leu Ser Phe Leu Asp Leu Gln Gly Tyr Val Lys Gln Met Lys Ala  
225 230 235 240

Leu Lys Arg Thr Phe Asp Lys Phe His Asn Ile Val Leu Asp Asp His  
245 250 255

Arg Ala Lys Lys Asn Ala Glu Lys Asn Phe Val Pro Lys Asp Met Val  
260 265 270

Asp Val Leu Leu Lys Met Ala Glu Asp Pro Asn Leu Glu Val Lys Leu  
275 280 285

Thr Asn Asp Cys Val Lys Gly Leu Met Gln Asp Leu Leu Thr Gly Gly  
290 295 300

Thr Asp Ser Leu Thr Ala Ala Val Gln Trp Ala Phe Gln Glu Leu Leu  
305 310 315 320

Arg Gln Pro Arg Val Ile Glu Lys Ala Thr Glu Glu Leu Asp Arg Ile  
Page 187

Val Gly Lys Glu Arg Trp Val Glu Glu Lys Asp Cys Ser Gln Leu Ser  
340 345 350

Tyr Val Glu Ala Ile Leu Lys Glu Thr Leu Arg Leu His Pro Leu Gly  
355 360 365

Thr Met Leu Ala Pro His Cys Ala Ile Glu Asp Cys Asn Val Ala Gly  
370 375 380

Tyr Asp Ile Gln Lys Gly Thr Thr Val Leu Val Asn Val Trp Thr Ile  
385 390 395 400

Gly Arg Asp Pro Lys Tyr Trp Asp Arg Ala Gln Glu Phe Leu Pro Glu  
405 410 415

Arg Phe Leu Glu Asn Asp Ile Asp Met Asp Gly His Asn Phe Ala Phe  
420 425 430

Leu Pro Phe Gly Ser Gly Arg Arg Arg Cys Pro Gly Tyr Ser Leu Gly  
435 440 445

Leu Lys Val Ile Arg Val Thr Leu Ala Asn Met Leu His Gly Phe Asn  
450 455 460

Trp Lys Leu Pro Glu Gly Met Lys Pro Glu Asp Ile Ser Val Glu Glu  
465 470 475 480

His Tyr Gly Leu Thr Thr His Pro Lys Phe Pro Val Pro Val Ile Leu  
485 490 495

Glu Ser Arg Leu Ser Ser Asp Leu Tyr Ser Pro Ile Thr  
500 505

<210> 241  
<211> 1615  
<212> DNA  
<213> NICOTIANATABACUM

<400> 241  
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aattcaaaaa tgggtgaaat aacagattgc caccaggtcc tataggttta ccattcattg 120  
gaaatttgca tcaatacgat agtataactc ctcatatcta tttttggaaa ctttcaaaaa 180  
aatatggcaa aatcttctca ttaaaacttg cttctactaa tgtggtagta gtttcttcag 240  
caaaattagc aaaagaagta ttgaaaaaac aagatttaat atttttagt agaccatcta 300



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ttcttggcca acaaaaactg tcttattatg gtcgtgatat tgcttttaat gattattgga 360
gagaaatgag aaaaatttgt gttcttcatc tttttagttt aaaaaaagtt caattattta 420
gtccaattcg tgaagatgaa gtttttagaa tgattaagaa aatatcaaaa caagcttcta 480
cttcacaaat tattaatttg agtaatttaa tgatttcatt aacaagtaca attatttgta 540
gagttgcttt tgggtgtagg attgaagaag aagcacatgc aaggaagaga tttgattttc 600
ttttggccga ggcacaagaa atgatggcta gtttctttgt atctgatttt tttccctttt 660
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atctcactat ggaagatata aaaggaattc tcatgaatgt gttagttgca ggatcagaca 900
ctagtgcagc tgctactgtt tgggcaatga cagccttgat aaagaatcct aaagccatgg 960
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cagctccact tttagttcca agagaatcaa tggaaaaaac catattagaa ggttatgaaa 1140
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acataattag tacatgttta aaatgtataa atatagtaga accattctca tgggtt 1615

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&lt;210&gt; 242

&lt;211&gt; 492

&lt;212&gt; PRT

&lt;213&gt; NICOTIANATABACUM

&lt;400&gt; 242

```

Met Leu Phe Leu Leu Phe Val Ala Leu Pro Phe Ile Leu Ile Phe Leu
1           5           10          15

```

```

Leu Pro Lys Phe Lys Asn Gly Gly Asn Asn Arg Leu Pro Pro Gly Pro
          20          25          30

```

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Ile Gly Leu Pro Phe Ile Gly Asn Leu His Gln Tyr Asp Ser Ile Thr
      35          40          45

```

79601-7270 Sequence Listing v2 -03-25-04.ST25

Pro His Ile Tyr Phe Trp Lys Leu Ser Lys Lys Tyr Gly Lys Ile Phe  
50 55 60

Ser Leu Lys Leu Ala Ser Thr Asn Val Val Val Val Ser Ser Ala Lys  
65 70 75 80

Leu Ala Lys Glu Val Leu Lys Lys Gln Asp Leu Ile Phe Cys Ser Arg  
85 90 95

Pro Ser Ile Leu Gly Gln Gln Lys Leu Ser Tyr Tyr Gly Arg Asp Ile  
100 105 110

Ala Phe Asn Asp Tyr Trp Arg Glu Met Arg Lys Ile Cys Val Leu His  
115 120 125

Leu Phe Ser Leu Lys Lys Val Gln Leu Phe Ser Pro Ile Arg Glu Asp  
130 135 140

Glu Val Phe Arg Met Ile Lys Lys Ile Ser Lys Gln Ala Ser Thr Ser  
145 150 155 160

Gln Ile Ile Asn Leu Ser Asn Leu Met Ile Ser Leu Thr Ser Thr Ile  
165 170 175

Ile Cys Arg Val Ala Phe Gly Val Arg Ile Glu Glu Glu Ala His Ala  
180 185 190

Arg Lys Arg Phe Asp Phe Leu Leu Ala Glu Ala Gln Glu Met Met Ala  
195 200 205

Ser Phe Phe Val Ser Asp Phe Phe Pro Phe Leu Ser Trp Ile Asp Lys  
210 215 220

Leu Ser Gly Leu Thr Tyr Arg Leu Glu Arg Asn Phe Lys Asp Leu Asp  
225 230 235 240

Asn Phe Tyr Glu Glu Leu Ile Glu Gln His Gln Asn Pro Asn Lys Pro  
245 250 255

Lys Tyr Met Glu Gly Asp Ile Val Asp Leu Leu Leu Gln Leu Lys Lys  
260 265 270

Glu Lys Leu Thr Pro Leu Asp Leu Thr Met Glu Asp Ile Lys Gly Ile  
275 280 285

Leu Met Asn Val Leu Val Ala Gly Ser Asp Thr Ser Ala Ala Ala Thr  
290 295 300

79601-7270 Sequence Listing v2 -03-25-04.ST25

Val Trp Ala Met Thr Ala Leu Ile Lys Asn Pro Lys Ala Met Glu Lys  
305 310 315 320

Val Gln Leu Glu Ile Arg Lys Ser Val Gly Lys Lys Gly Ile Val Asn  
325 330 335

Glu Glu Asp Val Gln Asn Ile Pro Tyr Phe Lys Ala Val Ile Lys Glu  
340 345 350

Ile Phe Arg Leu Tyr Pro Pro Ala Pro Leu Leu Val Pro Arg Glu Ser  
355 360 365

Met Glu Lys Thr Ile Leu Glu Gly Tyr Glu Ile Arg Pro Arg Thr Ile  
370 375 380

Val His Val Asn Ala Trp Ala Ile Ala Arg Asp Pro Glu Ile Trp Glu  
385 390 395 400

Asn Pro Asp Glu Phe Ile Pro Glu Arg Phe Leu Asn Ser Ser Ile Asp  
405 410 415

Tyr Lys Gly Gln Asp Phe Glu Leu Leu Pro Phe Gly Ala Gly Arg Arg  
420 425 430

Gly Cys Pro Gly Ile Ala Leu Gly Val Ala Ser Met Glu Leu Ala Leu  
435 440 445

Ser Asn Leu Leu Tyr Ala Phe Asp Trp Glu Leu Pro Tyr Gly Val Lys  
450 455 460

Lys Glu Asp Ile Asp Thr Asn Val Arg Pro Gly Ile Ala Met His Lys  
465 470 475 480

Lys Asn Glu Leu Cys Leu Val Pro Lys Asn Tyr Leu  
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<210> 243  
<211> 1624  
<212> DNA  
<213> NICOTIANATABACUM

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gaaatttgca tcaatatgat agtataactc ctcatatcta tttttggaaa ctttccaaaa 180  
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aattatttag tccaattcgt gaagatgaag tttttagaat gattaagaaa atatcaaaac 480
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tgggacgtgg atctcatgct agttctgtgc ggtcagctaa gcttattatt tttggctcaa 1560
attatgtata cataattagt acatgtttta aatgtataaa tatagtagaa ccattctcat 1620
ggtt 1624

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<210> 244  
 <211> 495  
 <212> PRT  
 <213> NICOTIANATABACUM

<400> 244

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Leu Pro Lys Phe Lys Asn Gly Gly Asn Asn Arg Leu Pro Pro Gly Pro  
 20 25 30

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Ile Gly Leu Pro Phe Ile Gly Asn Leu His Gln Tyr Asp Ser Ile Thr  
35 40 45

Pro His Ile Tyr Phe Trp Lys Leu Ser Lys Lys Tyr Gly Lys Ile Phe  
50 55 60

Ser Leu Lys Leu Ala Ser Thr Asn Val Val Val Val Ser Ser Ala Lys  
65 70 75 80

Leu Ala Lys Glu Val Leu Lys Lys Gln Asp Leu Ile Phe Cys Ser Arg  
85 90 95

Pro Ser Ile Leu Gly Gln Gln Lys Leu Ser Tyr Tyr Gly Arg Asp Ile  
100 105 110

Ala Phe Ala Pro Tyr Asn Asp Tyr Trp Arg Glu Met Arg Lys Ile Cys  
115 120 125

Val Leu His Leu Phe Ser Leu Lys Lys Val Gln Leu Phe Ser Pro Ile  
130 135 140

Arg Glu Asp Glu Val Phe Arg Met Ile Lys Lys Ile Ser Lys Gln Ala  
145 150 155 160

Ser Thr Ser Gln Ile Ile Asn Leu Ser Asn Leu Met Ile Ser Leu Thr  
165 170 175

Ser Thr Ile Ile Cys Arg Val Ala Phe Gly Val Arg Phe Glu Glu Glu  
180 185 190

Ala His Ala Arg Lys Arg Phe Asp Phe Leu Leu Ala Glu Ala Gln Glu  
195 200 205

Met Met Ala Ser Phe Phe Val Ser Asp Phe Phe Pro Phe Leu Ser Trp  
210 215 220

Ile Asp Lys Leu Ser Gly Leu Thr Tyr Arg Leu Glu Arg Asn Phe Lys  
225 230 235 240

Asp Leu Asp Asn Phe Tyr Glu Glu Leu Ile Glu Gln His Gln Asn Pro  
245 250 255

Asn Lys Pro Lys Tyr Met Glu Gly Asp Ile Val Asp Leu Leu Leu Gln  
260 265 270

Leu Lys Lys Glu Lys Leu Thr Pro Leu Asp Leu Thr Met Glu Asp Ile  
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275

280

285

Lys Gly Ile Leu Met Asn Val Leu Val Ala Gly Ser Asp Thr Ser Ala  
290 295 300

Ala Ala Thr Val Trp Ala Met Thr Ala Leu Ile Lys Asn Pro Lys Ala  
305 310 315 320

Met Glu Lys Val Gln Leu Glu Ile Arg Lys Ser Val Gly Lys Lys Gly  
325 330 335

Ile Val Asn Glu Glu Asp Val Gln Asn Ile Pro Tyr Phe Lys Ala Val  
340 345 350

Ile Lys Glu Ile Phe Arg Leu Tyr Pro Pro Ala Pro Leu Leu Val Pro  
355 360 365

Arg Glu Ser Met Glu Lys Thr Ile Leu Glu Gly Tyr Glu Ile Arg Pro  
370 375 380

Arg Thr Ile Val His Val Asn Ala Trp Ala Ile Ala Arg Asp Pro Glu  
385 390 395 400

Ile Trp Glu Asn Pro Asp Glu Phe Ile Pro Glu Arg Phe Leu Asn Ser  
405 410 415

Ser Ile Asp Tyr Lys Gly Gln Asp Phe Glu Leu Leu Pro Phe Gly Ala  
420 425 430

Gly Arg Arg Gly Cys Pro Gly Ile Ala Leu Gly Val Ala Ser Met Glu  
435 440 445

Leu Ala Leu Ser Asn Leu Leu Tyr Ala Phe Asp Trp Glu Leu Pro Tyr  
450 455 460

Gly Val Lys Lys Glu Asp Ile Asp Thr Asn Val Arg Pro Gly Ile Ala  
465 470 475 480

Met His Lys Lys Asn Glu Leu Cys Leu Val Pro Lys Asn Tyr Leu  
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<210> 245

<211> 1627

<212> DNA

<213> NICOTIANATABACUM

<400> 245

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&lt;210&gt; 246

&lt;211&gt; 517

&lt;212&gt; PRT

&lt;213&gt; NICOTIANATABACUM

&lt;400&gt; 246

Met Val Phe Pro Ile Glu Ala Phe Val Gly Leu Val Thr Phe Thr Phe

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1          5          10          15
Leu Leu Tyr Phe Leu Trp Thr Lys Lys Ser Gln Lys Leu Pro Lys Pro
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Leu Leu Pro Lys Ile Pro Gly Gly Trp Pro Val Ile Gly His Leu Phe
      35      40      45
His Phe Asn Asn Asp Gly Asp Asp Arg Pro Leu Ala Arg Lys Leu Gly
      50      55      60
Asp Leu Ala Asp Lys Tyr Gly Pro Val Phe Thr Phe Arg Leu Gly Leu
      65      70      75      80
Pro Leu Val Leu Val Val Ser Ser Tyr Glu Ala Ile Lys Asp Cys Phe
      85      90      95
Ser Thr Asn Asp Ala Ile Phe Ser Asn Arg Pro Ala Phe Leu Tyr Gly
      100      105      110
Glu Tyr Leu Gly Tyr Asn Asn Thr Met Leu Phe Leu Ala Asn Tyr Gly
      115      120      125
Pro Tyr Trp Arg Lys Asn Arg Lys Leu Val Ile Gln Glu Val Leu Ser
      130      135      140
Ala Ser Arg Leu Glu Lys Phe Lys Gln Val Arg Phe Thr Arg Ile Gln
      145      150      155      160
Thr Ser Ile Lys Asn Leu Tyr Thr Arg Ile Asn Gly Asn Ser Ser Thr
      165      170      175
Ile Asn Leu Thr Asp Trp Leu Glu Glu Leu Asp Phe Gly Leu Ile Val
      180      185      190
Lys Met Ile Ala Gly Lys Asn Tyr Glu Ser Gly Lys Gly Asp Glu Gln
      195      200      205
Val Glu Arg Phe Lys Asn Ala Phe Lys Asp Phe Met Val Leu Ser Met
      210      215      220
Glu Phe Val Leu Trp Asp Ala Phe Pro Ile Pro Leu Phe Lys Trp Val
      225      230      235      240
Asp Phe Gln Gly His Ile Lys Ala Met Lys Arg Thr Phe Lys Asp Ile
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Asp Ser Val Phe Gln Asn Trp Leu Glu Glu His Ile Asn Lys Arg Glu  
 260 265 270

Lys Met Glu Val Gly Ala Glu Gly Asn Glu Gln Asp Phe Ile Asp Val  
 275 280 285

Val Leu Ser Lys Leu Ser Lys Glu Tyr Leu Asp Glu Gly Tyr Ser Arg  
 290 295 300

Asp Thr Val Ile Lys Ala Thr Val Phe Ser Leu Val Leu Asp Ala Ala  
 305 310 315 320

Asp Thr Val Ala Leu His Ile Asn Trp Gly Met Thr Leu Leu Ile Asn  
 325 330 335

Asn Gln Asn Ala Leu Met Lys Ala Gln Glu Glu Ile Asp Thr Lys Val  
 340 345 350

Gly Lys Tyr Arg Trp Val Glu Glu Ser Asp Ile Lys Asp Leu Val Tyr  
 355 360 365

Leu Gln Ala Ile Val Lys Lys Val Leu Arg Leu Tyr Pro Pro Gly Pro  
 370 375 380

Leu Leu Val Pro His Glu Tyr Val Lys Asp Cys Val Val Ser Gly Tyr  
 385 390 395 400

His Ile Pro Lys Gly Thr Arg Leu Phe Ala Asn Val Met Lys Leu Gln  
 405 410 415

Arg Asp Pro Lys Leu Leu Ser Asn Pro Asp Lys Phe Asp Pro Glu Arg  
 420 425 430

Phe Ile Ala Gly Asp Ile Asp Phe Arg Gly His His Tyr Glu Phe Ile  
 435 440 445

Pro Phe Gly Ser Gly Arg Arg Ser Cys Pro Gly Met Thr Tyr Ala Leu  
 450 455 460

Gln Val Glu His Leu Thr Met Ala His Leu Ile Gln Gly Phe Asn Tyr  
 465 470 475 480

Lys Thr Pro Asn Asp Glu Ala Leu Asp Met Lys Glu Gly Ala Gly Ile  
 485 490 495

Thr Ile Arg Lys Val Asn Pro Val Glu Leu Ile Ile Thr Pro Arg Leu  
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Ala Pro Glu Leu Tyr  
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<211> 1594  
<212> DNA  
<213> NICOTIANATABACUM

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1594

<210> 248  
 <211> 505  
 <212> PRT  
 <213> NICOTIANATABACUM

<400> 248

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Ile Leu Ile Ala Leu Ile Val Ser Lys Leu Arg Ser Lys Arg Phe Lys  
 20 25 30

Leu Pro Pro Gly Pro Ile Pro Val Pro Val Phe Gly Asn Trp Leu Gln  
 35 40 45

Val Gly Asp Asp Leu Asn His Arg Asn Leu Thr Asp Tyr Ala Lys Lys  
 50 55 60

Phe Gly Asp Leu Phe Leu Leu Arg Met Gly Gln Arg Asn Leu Val Val  
 65 70 75 80

Val Ser Ser Pro Glu Leu Ala Lys Glu Val Leu His Thr Gln Gly Val  
 85 90 95

Glu Phe Gly Ser Arg Thr Arg Asn Val Val Phe Asp Ile Phe Thr Gly  
 100 105 110

Lys Gly Gln Asp Met Val Phe Thr Val Tyr Gly Glu His Trp Arg Lys  
 115 120 125

Met Arg Arg Ile Met Thr Val Pro Phe Phe Thr Asn Lys Val Val Gln  
 130 135 140

Gln Tyr Arg Gly Gly Trp Glu Phe Glu Val Ala Ser Val Ile Glu Asp  
 145 150 155 160

Val Lys Lys Asn Pro Glu Ser Ala Thr Asn Gly Ile Val Leu Arg Arg  
 165 170 175

Arg Leu Gln Leu Met Met Tyr Asn Asn Met Phe Arg Ile Met Phe Asp  
 180 185 190

Arg Arg Phe Glu Ser Glu Asp Asp Pro Leu Phe Val Lys Leu Lys Ala  
 195 200 205

Leu Asn Gly Glu Arg Ser Arg Leu Ala Gln Ser Phe Glu Tyr Asn Tyr  
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210

215

220

Gly Asp Phe Ile Pro Ile Leu Arg Pro Leu Leu Arg Gly Tyr Leu Lys  
 225 230 235 240

Ile Cys Lys Glu Val Lys Glu Lys Arg Leu Gln Leu Phe Lys Asp Tyr  
 245 250 255

Phe Val Asp Glu Arg Lys Lys Leu Ser Asn Thr Lys Ser Ser Asp Ser  
 260 265 270

Asn Ala Leu Lys Cys Ala Ile Asp His Ile Leu Glu Ala Gln Gln Lys  
 275 280 285

Gly Glu Ile Asn Glu Asp Asn Val Leu Tyr Ile Val Glu Asn Ile Asn  
 290 295 300

Val Ala Ala Ile Glu Thr Thr Leu Trp Ser Ile Glu Trp Gly Ile Ala  
 305 310 315 320

Glu Leu Val Asn His Pro His Ile Gln Lys Lys Leu Arg Asp Glu Ile  
 325 330 335

Asp Thr Val Leu Gly Pro Gly Val Gln Val Thr Glu Pro Asp Thr His  
 340 345 350

Lys Leu Pro Tyr Leu Gln Ala Val Ile Lys Glu Ala Leu Arg Leu Arg  
 355 360 365

Met Ala Ile Pro Leu Leu Val Pro His Met Asn Leu His Asp Ala Lys  
 370 375 380

Leu Gly Gly Leu Asp Ile Pro Ala Glu Ser Lys Ile Leu Val Asn Ala  
 385 390 395 400

Trp Trp Leu Ala Asn Asn Pro Ala His Trp Lys Lys Pro Glu Glu Phe  
 405 410 415

Arg Pro Glu Arg Phe Phe Glu Glu Glu Lys His Val Glu Ala Asn Gly  
 420 425 430

Asn Asp Phe Arg Tyr Leu Pro Phe Gly Val Gly Arg Arg Ser Cys Pro  
 435 440 445

Gly Ile Ile Leu Ala Leu Pro Ile Leu Gly Ile Thr Leu Gly Arg Leu  
 450 455 460

## 79601-7270 Sequence Listing v2 -03-25-04.ST25

Val Gln Asn Phe Glu Leu Leu Pro Pro Pro Gly Gln Ser Lys Leu Asp  
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Thr Thr Glu Lys Gly Gly Gln Phe Ser Leu His Ile Leu Lys His Ser  
 485 490 495

Thr Ile Val Leu Lys Pro Arg Ser Phe  
 500 505

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 <211> 1678  
 <212> DNA  
 <213> NICOTIANATABACUM

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ttagtaagcc atcaaacacg ccaattgaca tgacagaagg cgtaggcggt actttgccta 1560  
aggttaatca agttgaagtt ctaattaccc ctcgtttacc ttctaagctt tattttatttt 1620  
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<210> 250  
<211> 521  
<212> PRT  
<213> NICOTIANATABACUM  
<400> 250

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Ala Phe Val Phe Leu Ser Ile Ile Leu Trp Arg Arg Thr Leu Thr Ser  
20 25 30  
Arg Lys Leu Ala Pro Glu Ile Pro Gly Ala Trp Pro Ile Ile Gly His  
35 40 45  
Leu Arg Gln Leu Ser Gly Thr Asp Lys Asn Ile Pro Phe Pro Arg Ile  
50 55 60  
Leu Gly Ala Leu Ala Asp Lys Tyr Gly Pro Val Phe Thr Leu Arg Ile  
65 70 75 80  
Gly Met Tyr Pro Tyr Leu Ile Val Asn Asn Trp Glu Ala Ala Lys Asp  
85 90 95  
Cys Leu Thr Thr His Asp Lys Asp Phe Ala Ala Arg Pro Thr Ser Met  
100 105 110  
Ala Gly Glu Ser Ile Gly Tyr Lys Tyr Ala Arg Phe Thr Tyr Ala Asn  
115 120 125  
Phe Gly Pro Tyr Tyr Asn Gln Val Arg Lys Leu Ala Leu Gln His Val  
130 135 140  
Pro Ser Ser Thr Lys Leu Glu Lys Met Lys His Ile Arg Val Ser Glu  
145 150 155 160  
Leu Glu Thr Ser Ile Lys Glu Leu Tyr Ser Leu Thr Leu Gly Lys Asn  
165 170 175

## 79601-7270 Sequence Listing v2 -03-25-04.ST25

Asn Met Gln Lys Val Asn Ile Ser Lys Trp Phe Glu Gln Leu Thr Leu  
 180 185 190  
 Asn Ile Ile Val Lys Thr Ile Cys Gly Lys Arg Tyr Ser Asn Ile Glu  
 195 200 205  
 Glu Asp Glu Glu Ala Gln Arg Phe Arg Lys Ala Phe Lys Gly Ile Met  
 210 215 220  
 Phe Val Val Gly Gln Ile Val Leu Tyr Asp Ala Ile Pro Phe Pro Leu  
 225 230 235 240  
 Phe Lys Tyr Phe Asp Phe Gln Gly His Ile Gln Leu Met Asn Lys Ile  
 245 250 255  
 Tyr Lys Asp Leu Asp Ser Ile Leu Gln Gly Trp Leu Asp Asp His Met  
 260 265 270  
 Met Asn Lys Asp Val Asn Asn Lys Asp Gln Asp Ala Ile Asp Ala Met  
 275 280 285  
 Leu Lys Val Thr Gln Leu Asn Glu Phe Lys Ala Tyr Gly Phe Ser Gln  
 290 295 300  
 Ala Thr Val Ile Lys Ser Thr Val Leu Ser Leu Ile Leu Asp Gly Asn  
 305 310 315 320  
 Asp Thr Thr Ala Val His Leu Ile Trp Val Met Ser Leu Leu Leu Asn  
 325 330 335  
 Asn Pro His Val Met Lys Gln Gly Gln Glu Glu Ile Asp Met Lys Val  
 340 345 350  
 Gly Lys Glu Arg Trp Ile Glu Asp Thr Asp Ile Lys Asn Leu Val Tyr  
 355 360 365  
 Leu Gln Ala Ile Val Lys Glu Thr Leu Arg Leu Tyr Pro Pro Val Pro  
 370 375 380  
 Phe Leu Leu Pro His Glu Ala Val Gln Asp Cys Lys Val Thr Gly Tyr  
 385 390 395 400  
 His Ile Pro Lys Gly Thr Arg Leu Tyr Ile Asn Ala Trp Lys Val His  
 405 410 415  
 Arg Asp Pro Glu Ile Trp Ser Glu Pro Glu Lys Phe Met Pro Asn Arg  
 420 425 430

79601-7270 Sequence Listing v2 -03-25-04.ST25

Phe Leu Thr Ser Lys Ala Asn Ile Asp Ala Arg Gly Gln Asn Phe Glu  
435 440 445

Phe Ile Pro Phe Gly Ser Gly Arg Arg Ser Cys Pro Gly Ile Gly Phe  
450 455 460

Ala Thr Leu Val Thr His Leu Thr Phe Gly Arg Leu Leu Gln Gly Phe  
465 470 475 480

Asp Phe Ser Lys Pro Ser Asn Thr Pro Ile Asp Met Thr Glu Gly Val  
485 490 495

Gly Val Thr Leu Pro Lys Val Asn Gln Val Glu Val Leu Ile Thr Pro  
500 505 510

Arg Leu Pro Ser Lys Leu Tyr Leu Phe  
515 520

<210> 251  
<211> 1537  
<212> DNA  
<213> NICOTIANATABACUM

<400> 251  
tgataatgct ctttctactc tttgtagccc ttcctttcat tcttattttt cttcttccta 60  
aattcaaaaa tgggtggaaat aacagattgc caccaggtcc tataggttta ccattcattg 120  
gaaatttgca tcaatatgat agtataactc ctcatatcta tttttggaaa ctttccaaaa 180  
aatatggcaa aatcttctca ttaaaacttg cttctactaa tgtggtagta gtttcttcag 240  
caaaattagc aaaagaagta ttgaaaaaac aagatttaat atttttagtg agaccatcta 300  
ttcttggcca acaaaaactg tcttattatg gtcgtgatat tgcttttgca ccttataatg 360  
attattggag agaaatgaga aaaatttggtg ttcttcatct ttttagttta aaaaaagttc 420  
aattatttag tccaattcgt gaagatgaag tttttagaat gattaagaaa atatcaaaac 480  
aagcttctac ttcacaaatt attaatgtga gtaatttaat gatttcatta acaagtacaa 540  
ttattttag agttgctttt ggtgttaggt ttgaagaaga agcacatgca aggaagagat 600  
ttgattttct tttggccgag gcacaagaaa tgatggctag tttctttgta tctgattttt 660  
ttcccttttt aagttggatt gataaattaa gtggattgac atatagactt gagaggaatt 720  
tcaaggattt ggataatttt tatgaagaac tcattgagca acatcaaaat cctaataagc 780  
caaaatatat ggaaggagat attgttgatc ttttgctaca attgaagaaa gagaaattaa 840  
caccacttga tctcactatg gaagatataa aaggaattct catgaatgtg ttagttgcag 900  
gatcagacac tagtgcagct gctactgttt gggcaatgac agccttgata aagaatccta 960



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```

aagccatgga aaaagttcaa ttagaaatca gaaaatcagt tgggaagaaa ggcattgtaa 1020
atgaagaaga tgtccaaaac atcccttatt ttaaagcagt gataaaggaa atatttagat 1080
tgtatccacc agtccactt ttagttccaa gagaatcaat ggaaaaaacc atattagaag 1140
gttatgaaat tcggccaaga accatagttc atgttaacgc ttgggctata gcaagggatc 1200
ctgaaatatg ggaaaatcca gatgaattta tacctgagag atttttgaat agcagtaccg 1260
attacaaggg tcaagatttt gagttacttc catttggtgc aggcagaaga ggttgcccag 1320
gtattgcact tggggttgca tccatggaac ttgctttgtc aaatcttctt tatgcatttg 1380
attgggagtt gccttatgga gtgaaaaaag aagacatcga cacaacggt aggcctggaa 1440
ttgccatgca caagaaaaac gaactttgcc ttgtcccaa aaattattta taaattatat 1500
tgggacgtgg atctcaattt agttctgtga ggtcagc 1537

```

<210> 252  
 <211> 495  
 <212> PRT  
 <213> NICOTIANATABACUM

<400> 252

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Met Leu Phe Leu Leu Phe Val Ala Leu Pro Phe Ile Leu Ile Phe Leu
1           5           10           15

```

```

Leu Pro Lys Phe Lys Asn Gly Gly Asn Asn Arg Leu Pro Pro Gly Pro
20           25           30

```

```

Ile Gly Leu Pro Phe Ile Gly Asn Leu His Gln Tyr Asp Ser Ile Thr
35           40           45

```

```

Pro His Ile Tyr Phe Trp Lys Leu Ser Lys Lys Tyr Gly Lys Ile Phe
50           55           60

```

```

Ser Leu Lys Leu Ala Ser Thr Asn Val Val Val Val Ser Ser Ala Lys
65           70           75           80

```

```

Leu Ala Lys Glu Val Leu Lys Lys Gln Asp Leu Ile Phe Cys Ser Arg
85           90           95

```

```

Pro Ser Ile Leu Gly Gln Gln Lys Leu Ser Tyr Tyr Gly Arg Asp Ile
100          105          110

```

```

Ala Phe Ala Pro Tyr Asn Asp Tyr Trp Arg Glu Met Arg Lys Ile Cys
115          120          125

```

```

Val Leu His Leu Phe Ser Leu Lys Lys Val Gln Leu Phe Ser Pro Ile
130          135          140

```

79601-7270 Sequence Listing v2 -03-25-04.ST25

Arg Glu Asp Glu Val Phe Arg Met Ile Lys Lys Ile Ser Lys Gln Ala  
 145 150 155 160  
 Ser Thr Ser Gln Ile Ile Asn Leu Ser Asn Leu Met Ile Ser Leu Thr  
 165 170 175  
 Ser Thr Ile Ile Cys Arg Val Ala Phe Gly Val Arg Phe Glu Glu Glu  
 180 185 190  
 Ala His Ala Arg Lys Arg Phe Asp Phe Leu Leu Ala Glu Ala Gln Glu  
 195 200 205  
 Met Met Ala Ser Phe Phe Val Ser Asp Phe Phe Pro Phe Leu Ser Trp  
 210 215 220  
 Ile Asp Lys Leu Ser Gly Leu Thr Tyr Arg Leu Glu Arg Asn Phe Lys  
 225 230 235 240  
 Asp Leu Asp Asn Phe Tyr Glu Glu Leu Ile Glu Gln His Gln Asn Pro  
 245 250 255  
 Asn Lys Pro Lys Tyr Met Glu Gly Asp Ile Val Asp Leu Leu Leu Gln  
 260 265 270  
 Leu Lys Lys Glu Lys Leu Thr Pro Leu Asp Leu Thr Met Glu Asp Ile  
 275 280 285  
 Lys Gly Ile Leu Met Asn Val Leu Val Ala Gly Ser Asp Thr Ser Ala  
 290 295 300  
 Ala Ala Thr Val Trp Ala Met Thr Ala Leu Ile Lys Asn Pro Lys Ala  
 305 310 315 320  
 Met Glu Lys Val Gln Leu Glu Ile Arg Lys Ser Val Gly Lys Lys Gly  
 325 330 335  
 Ile Val Asn Glu Glu Asp Val Gln Asn Ile Pro Tyr Phe Lys Ala Val  
 340 345 350  
 Ile Lys Glu Ile Phe Arg Leu Tyr Pro Pro Ala Pro Leu Leu Val Pro  
 355 360 365  
 Arg Glu Ser Met Glu Lys Thr Ile Leu Glu Gly Tyr Glu Ile Arg Pro  
 370 375 380  
 Arg Thr Ile Val His Val Asn Ala Trp Ala Ile Ala Arg Asp Pro Glu  
 385 390 395 400

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Ile Trp Glu Asn Pro Asp Glu Phe Ile Pro Glu Arg Phe Leu Asn Ser  
 405 410 415

Ser Thr Asp Tyr Lys Gly Gln Asp Phe Glu Leu Leu Pro Phe Gly Ala  
 420 425 430

Gly Arg Arg Gly Cys Pro Gly Ile Ala Leu Gly Val Ala Ser Met Glu  
 435 440 445

Leu Ala Leu Ser Asn Leu Leu Tyr Ala Phe Asp Trp Glu Leu Pro Tyr  
 450 455 460

Gly Val Lys Lys Glu Asp Ile Asp Thr Asn Val Arg Pro Gly Ile Ala  
 465 470 475 480

Met His Lys Lys Asn Glu Leu Cys Leu Val Pro Lys Asn Tyr Leu  
 485 490 495

<210> 253  
 <211> 1572  
 <212> DNA  
 <213> NICOTIANATABACUM

<400> 253  
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 aactctacca ccgtcttaga ttcaaactac caccagggtcc gcggccgta ccggtggtcg 120  
 gaaacctcta cgacataaaa ccggtgagat tccggtgctt tgccgattgg gccaaaactt 180  
 acggtccgat tttctcagta tactttgggt cacagttaaa tgttggtgta acaacagctg 240  
 aattagctaa agaagtattg aaagaaaatg accagaattt agcagataga tttaggacta 300  
 gacctgcaaa taatttgagc agaaatggga tggatttgat ttgggctgat tatgggcctc 360  
 attatgtgaa agtaaggaag ctctgtaatc ttgagctttt tactcctaaa agacttgaag 420  
 ctcttagacc tattagagaa gatgaagta ctgctatggt tgaaaacatt ttcaaggatt 480  
 gtactaagcc tgataacaca ggtaaaagct tgttgataag agagtactta ggatcagtag 540  
 cattcaacaa cattacaagg ttaacatttg ggaaaagggt catgaactca aaagggtgaga 600  
 ttgatgagca aggtcaagaa ttcaagggtt ttgtctctaa tggcatcaaa attggcggaa 660  
 aacttccctt ggcagagtat gttccatggc tccgttggtt tttcacaatg gaaaacgagg 720  
 cactcgtgaa gcactctgca cgtagagacc ggttaacaag aatgatcatg gatgaacaca 780  
 cactggctcg caagaaaact ggtgatacta agcagcattt tgtc gatgca ttgcttactc 840  
 ttcagaagca gtatgatctt agtgatgaca ctgttattgg cctcctctgg gatatgatta 900  
 cagcaggaat ggacacaaca accataacag tggaatgggc aatggcagaa ctagttaaga 960

## 79601-7270 Sequence Listing v2 -03-25-04.ST25

```

acccaagagt gcaactaaaa gctcaagagg agcttgacag ggtaatcgga acggatcgaa 1020
tcatgtcaga aaccgatttc tctaaacttc cttacctaca atgtgtagcc aaagaggctc 1080
taagggttga ccctccaact cctctaatac ttcctcataa ggccagtgcc agtgtcaaaa 1140
ttggtgggta tgacattcct aaggggtcca tcgtgcacgt gaacgtttgg gctgtcgctc 1200
gtgaccagc cgtgtggaag aaccggttgg agttcagacc agagcgcttc cttgaggaag 1260
acgttgacat gaagggtcac gactatcggt tattgccctt tgggtgcagga aggcgtgttt 1320
gccccggtgc acaacttgct atcaacttgg tcacatctat gttgggtcat ttgttgcatt 1380
attttacatg ggctccggcc ccggggggtta acccgaggga tattgacttg gaggagagcc 1440
ctggaacagt aacttacatg aaaaatccaa tacaagctat tccaactcca agattgcctg 1500
cacacttgta tggacgtgtg ccagtggata tgtaaaacat tttgttcttt cccttttttg 1560
ttatatgatg ag 1572

```

```

<210> 254
<211> 508
<212> PRT
<213> NICOTIANATABACUM

```

```

<400> 254

```

```

Met Ala Leu Ser Phe Ile Phe Ile Ser Ile Thr Leu Ile Phe Leu Val
1           5           10          15

His Lys Leu Tyr His Arg Leu Arg Phe Lys Leu Pro Pro Gly Pro Arg
20          25          30

Pro Leu Pro Val Val Gly Asn Leu Tyr Asp Ile Lys Pro Val Arg Phe
35          40          45

Arg Cys Phe Ala Asp Trp Ala Lys Thr Tyr Gly Pro Ile Phe Ser Val
50          55          60

Tyr Phe Gly Ser Gln Leu Asn Val Val Val Thr Thr Ala Glu Leu Ala
65          70          75          80

Lys Glu Val Leu Lys Glu Asn Asp Gln Asn Leu Ala Asp Arg Phe Arg
85          90          95

Thr Arg Pro Ala Asn Asn Leu Ser Arg Asn Gly Met Asp Leu Ile Trp
100         105         110

Ala Asp Tyr Gly Pro His Tyr Val Lys Val Arg Lys Leu Cys Asn Leu
115        120        125

```

## 79601-7270 Sequence Listing v2 -03-25-04.ST25

Glu Leu Phe Thr Pro Lys Arg Leu Glu Ala Leu Arg Pro Ile Arg Glu  
 130 135 140

Asp Glu Val Thr Ala Met Val Glu Asn Ile Phe Lys Asp Cys Thr Lys  
 145 150 155 160

Pro Asp Asn Thr Gly Lys Ser Leu Leu Ile Arg Glu Tyr Leu Gly Ser  
 165 170 175

Val Ala Phe Asn Asn Ile Thr Arg Leu Thr Phe Gly Lys Arg Phe Met  
 180 185 190

Asn Ser Lys Gly Glu Ile Asp Glu Gln Gly Gln Glu Phe Lys Gly Ile  
 195 200 205

Val Ser Asn Gly Ile Lys Ile Gly Gly Lys Leu Pro Leu Ala Glu Tyr  
 210 215 220

Val Pro Trp Leu Arg Trp Phe Phe Thr Met Glu Asn Glu Ala Leu Val  
 225 230 235 240

Lys His Ser Ala Arg Arg Asp Arg Leu Thr Arg Met Ile Met Asp Glu  
 245 250 255

His Thr Leu Ala Arg Lys Lys Thr Gly Asp Thr Lys Gln His Phe Val  
 260 265 270

Asp Ala Leu Leu Thr Leu Gln Lys Gln Tyr Asp Leu Ser Asp Asp Thr  
 275 280 285

Val Ile Gly Leu Leu Trp Asp Met Ile Thr Ala Gly Met Asp Thr Thr  
 290 295 300

Thr Ile Thr Val Glu Trp Ala Met Ala Glu Leu Val Lys Asn Pro Arg  
 305 310 315 320

Val Gln Leu Lys Ala Gln Glu Glu Leu Asp Arg Val Ile Gly Thr Asp  
 325 330 335

Arg Ile Met Ser Glu Thr Asp Phe Ser Lys Leu Pro Tyr Leu Gln Cys  
 340 345 350

Val Ala Lys Glu Ala Leu Arg Leu His Pro Pro Thr Pro Leu Met Leu  
 355 360 365

Pro His Lys Ala Ser Ala Ser Val Lys Ile Gly Gly Tyr Asp Ile Pro  
 370 375 380

79601-7270 Sequence Listing v2 -03-25-04.ST25

Lys Gly Ser Ile Val His Val Asn Val Trp Ala Val Ala Arg Asp Pro  
385 390 395 400

Ala Val Trp Lys Asn Pro Leu Glu Phe Arg Pro Glu Arg Phe Leu Glu  
405 410 415

Glu Asp Val Asp Met Lys Gly His Asp Tyr Arg Leu Leu Pro Phe Gly  
420 425 430

Ala Gly Arg Arg Val Cys Pro Gly Ala Gln Leu Ala Ile Asn Leu Val  
435 440 445

Thr Ser Met Leu Gly His Leu Leu His His Phe Thr Trp Ala Pro Ala  
450 455 460

Pro Gly Val Asn Pro Glu Asp Ile Asp Leu Glu Glu Ser Pro Gly Thr  
465 470 475 480

Val Thr Tyr Met Lys Asn Pro Ile Gln Ala Ile Pro Thr Pro Arg Leu  
485 490 495

Pro Ala His Leu Tyr Gly Arg Val Pro Val Asp Met  
500 505

<210> 255  
<211> 1580  
<212> DNA  
<213> NICOTIANATABACUM

<400> 255  
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ccttcatatt catatccata accctaattt ttctagttca taaactctac caccgtctta 120  
gattcaaact accaccaggt ccgcggccgt taccggtggt cggaacctc tacgacatag 180  
aaccggtgag attccggtgc ttgcccatt gggccaaaac ttacggtccg attttctcag 240  
tatacttttg gtcacagtta aatgtttgtg taacaacagc tgaattagct aaagaagtat 300  
tgaaagaaaa tgaccagaat ttagcagata gatttaggac tagacctgca aataatttga 360  
gcagaaatgg gatggatttg atttgggctg attatgggcc tcattatgtg aaagtaagga 420  
agctctgtaa tcttgagctt ttactccta aaagacttga agctcttaga cctattagag 480  
aagatgaagt tactgctatg gttgaaaaca ttttcaagga ttgtactaag cctgataaca 540  
caggtaaaag cttgttgata agagagtact taggatcagt agcattcaac aacattacaa 600  
ggttaacatt tgggaaaagg ttcatgaact caaaagggtga gattgatgag caagggtcaag 660  
aattcaaggg tattgtctct aatggcatca aaattggcgg aaaacttccc ttggcagagt 720

## 79601-7270 Sequence Listing v2 -03-25-04.ST25

```

atgttccatg gctccgttgg tttttcacia tggaaaacga ggcactcgtg aagcactctg 780
cacgtagaga ccggttaaca agaatgatca tggatgaaca cactactggct cgcaagaaaa 840
ctgggtgatac taagcagcat tttgtcgtg cattgcttac tcttcagaag cagtatgac 900
ttagtgatga cactgttatt ggcctcctct gggatatgat tacagcagga atggacacaa 960
caaccataac agtggaatgg gcaatggcag aactagttaa gaaccaaga gtgcaactaa 1020
aagctcaaga ggagcttgac agggtaatcg gaacggatcg aatcatgtca gaaaccgatt 1080
tctctaaact tccttaccta caatgtgtag ccaaagaggc tctaagggtg caccctccaa 1140
ctcctctaata gcttcctcat agggccagtg ccagtgtcaa aattgggtgt tatgacattc 1200
ctaaggggtc catcgtgcac gtgaacgttt gggctgtcgc tcgtgaccca gccgtgtgga 1260
agaacccgtt ggagttcaga ccagagcgct tccttgagga agacgttgac atgaagggtc 1320
acgactatcg gttattgccc tttggtgcag gaaggcgtgt ttgccccggt gcacaacttg 1380
ctatcaactt ggtcacatct atgttgggtc atttgttgca tcattttaca tgggctccgg 1440
ccccgggggt taaccggag gatattgact tggaggagag ccctggaaca gtaacttaca 1500
tgaaaaatcc aatacaagct attccaactc caagattgcc tgcacacttg tatggacgtg 1560
tgccagtgga tatgtaaaac 1580

```

&lt;210&gt; 256

&lt;211&gt; 520

&lt;212&gt; PRT

&lt;213&gt; NICOTIANATABACUM

&lt;400&gt; 256

```

Met Tyr Ser His Arg Ser Lys Val Ser Thr Lys Ile Met Ala Leu Ser
1           5           10           15

```

```

Phe Ile Phe Ile Ser Ile Thr Leu Ile Phe Leu Val His Lys Leu Tyr
20           25           30

```

```

His Arg Leu Arg Phe Lys Leu Pro Pro Gly Pro Arg Pro Leu Pro Val
35           40           45

```

```

Val Gly Asn Leu Tyr Asp Ile Glu Pro Val Arg Phe Arg Cys Phe Ala
50           55           60

```

```

Asp Trp Ala Lys Thr Tyr Gly Pro Ile Phe Ser Val Tyr Phe Gly Ser
65           70           75           80

```

```

Gln Leu Asn Val Val Val Thr Thr Ala Glu Leu Ala Lys Glu Val Leu
85           90           95

```

```

Lys Glu Asn Asp Gln Asn Leu Ala Asp Arg Phe Arg Thr Arg Pro Ala
Page 211

```

## 79601-7270 Sequence Listing v2 -03-25-04.ST25

100

105

110

Asn Asn Leu Ser Arg Asn Gly Met Asp Leu Ile Trp Ala Asp Tyr Gly  
 115 120 125

Pro His Tyr Val Lys Val Arg Lys Leu Cys Asn Leu Glu Leu Phe Thr  
 130 135 140

Pro Lys Arg Leu Glu Ala Leu Arg Pro Ile Arg Glu Asp Glu Val Thr  
 145 150 155 160

Ala Met Val Glu Asn Ile Phe Lys Asp Cys Thr Lys Pro Asp Asn Thr  
 165 170 175

Gly Lys Ser Leu Leu Ile Arg Glu Tyr Leu Gly Ser Val Ala Phe Asn  
 180 185 190

Asn Ile Thr Arg Leu Thr Phe Gly Lys Arg Phe Met Asn Ser Lys Gly  
 195 200 205

Glu Ile Asp Glu Gln Gly Gln Glu Phe Lys Gly Ile Val Ser Asn Gly  
 210 215 220

Ile Lys Ile Gly Gly Lys Leu Pro Leu Ala Glu Tyr Val Pro Trp Leu  
 225 230 235 240

Arg Trp Phe Phe Thr Met Glu Asn Glu Ala Leu Val Lys His Ser Ala  
 245 250 255

Arg Arg Asp Arg Leu Thr Arg Met Ile Met Asp Glu His Thr Leu Ala  
 260 265 270

Arg Lys Lys Thr Gly Asp Thr Lys Gln His Phe Val Asp Ala Leu Leu  
 275 280 285

Thr Leu Gln Lys Gln Tyr Asp Leu Ser Asp Asp Thr Val Ile Gly Leu  
 290 295 300

Leu Trp Asp Met Ile Thr Ala Gly Met Asp Thr Thr Thr Ile Thr Val  
 305 310 315 320

Glu Trp Ala Met Ala Glu Leu Val Lys Asn Pro Arg Val Gln Leu Lys  
 325 330 335

Ala Gln Glu Glu Leu Asp Arg Val Ile Gly Thr Asp Arg Ile Met Ser  
 340 345 350



## 79601-7270 Sequence Listing v2 -03-25-04.ST25

Glu Thr Asp Phe Ser Lys Leu Pro Tyr Leu Gln Cys Val Ala Lys Glu  
 355 360 365

Ala Leu Arg Leu His Pro Pro Thr Pro Leu Met Leu Pro His Arg Ala  
 370 375 380

Ser Ala Ser Val Lys Ile Gly Gly Tyr Asp Ile Pro Lys Gly Ser Ile  
 385 390 395 400

Val His Val Asn Val Trp Ala Val Ala Arg Asp Pro Ala Val Trp Lys  
 405 410 415

Asn Pro Leu Glu Phe Arg Pro Glu Arg Phe Leu Glu Glu Asp Val Asp  
 420 425 430

Met Lys Gly His Asp Tyr Arg Leu Leu Pro Phe Gly Ala Gly Arg Arg  
 435 440 445

Val Cys Pro Gly Ala Gln Leu Ala Ile Asn Leu Val Thr Ser Met Leu  
 450 455 460

Gly His Leu Leu His His Phe Thr Trp Ala Pro Ala Pro Gly Val Asn  
 465 470 475 480

Pro Glu Asp Ile Asp Leu Glu Glu Ser Pro Gly Thr Val Thr Tyr Met  
 485 490 495

Lys Asn Pro Ile Gln Ala Ile Pro Thr Pro Arg Leu Pro Ala His Leu  
 500 505 510

Tyr Gly Arg Val Pro Val Asp Met  
 515 520

<210> 257  
 <211> 1544  
 <212> DNA  
 <213> NICOTIANATABACUM

<400> 257  
 ataatgctct ttctactctt tgtagccctt cctttcattc ttatttttct tcttcctaaa 60  
 ttcaaaaatg gtggaaataa cagattgccca ccaggtccta taggtttacc attcattgga 120  
 aatttgcatt aatatgatag tataactcct catatctatt tttggaaaact ttccaaaaaa 180  
 tatggcaaaa tcttctcatt aaaacttgct tctactaatg tggtagtagt ttcttcagca 240  
 aaattagcaa aagaagtatt gaaaaaacia gatttaatat tttgtagtag accatctatt 300  
 cttggccaac aaaaactgtc ttattatggt cgtgatattg cttttgcacc ttataatgat 360  
 tattggagag aaatgagaaa aatttgtggt cttcatcttt ttagtttaaa aaaagttcaa 420

79601-7270 Sequence Listing v2 -03-25-04.ST25

```

ttatttagtc caattcgtga agatgaagtt tttagaatga ttaagaaaat atcaaaaacaa 480
gcttctactt cacaaattat taatttgagt aatttaatga tttcattaac aagtacaatt 540
attttagtag agttgcttttgg tgtaggttt gaagaagaag cacatgcaag gaagagattt 600
gattttcttt tggccgagggc acaagaaatg atggctagtt tctttgtatc tgattttttt 660
ccctttttta gtttagattga caaattaagt ggattgacat atagacttga gaggaatttc 720
aaggatttgg ataattttta tgaagaactc attgagcaac atcaaaatcc taataagcca 780
aaatatatgg aaggagatat tgtagatctt ttgctacaat tgaagaaaga gaaattaaca 840
ccacttgatc tcactatgga agatataaaa ggaattctca tgaatgtgtt agttgcagga 900
tcagacacta gtgcagctgc tactgtttgg gcaatgacag ccttgataaa gaatcctaaa 960
gccatggaaa aagttcaatt agaaatcaga aaatcagttg ggaagaaagg cattgtaaat 1020
gaagaagatg tccaaaacat cccttatttt aaagcagtga taaaggaaat atttagattg 1080
tatccaccag ctccactttt agttccaaga gaatcaatgg aaaaaacat attagaaggt 1140
tatgaaattc ggccaagaac catagtccat gttaacgctt gggctatagc aagggatcct 1200
gaaatatggg aaaatccaga tgaatttata cctgagagat ttttgaatag cagtatcgat 1260
tacaagggtc aagattttga gttacttcca tttggtgcag gcagaagagg ttgcccaggt 1320
attgcacttg ggggtgcatc catggaactt gctttgtcaa atcttcttta tgcatttgat 1380
tgaggagtgc cttatggagt gaaaaaagaa gacatcgaca caaacgtag gcctggaatt 1440
gccatgcaca agaaaaacga actttgcctt gtcccaaaaa aattatttat aaattatatt 1500
gggacgtgga tctcatgcta gttctgtgcg gtcagctaag cttta 1544

```

<210> 258  
 <211> 504  
 <212> PRT  
 <213> NICOTIANATABACUM

<400> 258

Met Leu Phe Leu Leu Phe Val Ala Leu Pro Phe Ile Leu Ile Phe Leu  
 1 5 10 15

Leu Pro Lys Phe Lys Asn Gly Gly Asn Asn Arg Leu Pro Pro Gly Pro  
 20 25 30

Ile Gly Leu Pro Phe Ile Gly Asn Leu His Gln Tyr Asp Ser Ile Thr  
 35 40 45

Pro His Ile Tyr Phe Trp Lys Leu Ser Lys Lys Tyr Gly Lys Ile Phe  
 50 55 60

## 79601-7270 Sequence Listing v2 -03-25-04.ST25

Ser Leu Lys Leu Ala Ser Thr Asn Val Val Val Val Ser Ser Ala Lys  
 65 70 75 80  
 Leu Ala Lys Glu Val Leu Lys Lys Gln Asp Leu Ile Phe Cys Ser Arg  
 85 90 95  
 Pro Ser Ile Leu Gly Gln Gln Lys Leu Ser Tyr Tyr Gly Arg Asp Ile  
 100 105 110  
 Ala Phe Ala Pro Tyr Asn Asp Tyr Trp Arg Glu Met Arg Lys Ile Cys  
 115 120 125  
 Val Leu His Leu Phe Ser Leu Lys Lys Val Gln Leu Phe Ser Pro Ile  
 130 135 140  
 Arg Glu Asp Glu Val Phe Arg Met Ile Lys Lys Ile Ser Lys Gln Ala  
 145 150 155 160  
 Ser Thr Ser Gln Ile Ile Asn Leu Ser Asn Leu Met Ile Ser Leu Thr  
 165 170 175  
 Ser Thr Ile Ile Cys Arg Val Ala Phe Gly Val Arg Phe Glu Glu Glu  
 180 185 190  
 Ala His Ala Arg Lys Arg Phe Asp Phe Leu Leu Ala Glu Ala Gln Glu  
 195 200 205  
 Met Met Ala Ser Phe Phe Val Ser Asp Phe Phe Pro Phe Leu Ser Ile  
 210 215 220  
 Asp Lys Leu Ser Gly Leu Thr Tyr Arg Leu Glu Arg Asn Phe Lys Asp  
 225 230 235 240  
 Leu Asp Asn Phe Tyr Glu Glu Leu Ile Glu Gln His Gln Asn Pro Asn  
 245 250 255  
 Lys Pro Lys Tyr Met Glu Gly Asp Ile Val Asp Leu Leu Leu Gln Leu  
 260 265 270  
 Lys Lys Glu Lys Leu Thr Pro Leu Asp Leu Thr Met Glu Asp Ile Lys  
 275 280 285  
 Gly Ile Leu Met Asn Val Leu Val Ala Gly Ser Asp Thr Ser Ala Ala  
 290 295 300  
 Ala Thr Val Trp Ala Met Thr Ala Leu Ile Lys Asn Pro Lys Ala Met  
 305 310 315 320

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Glu Lys Val Gln Leu Glu Ile Arg Lys Ser Val Gly Lys Lys Gly Ile  
325 330 335

Val Asn Glu Glu Asp Val Gln Asn Ile Pro Tyr Phe Lys Ala Val Ile  
340 345 350

Lys Glu Ile Phe Arg Leu Tyr Pro Pro Ala Pro Leu Leu Val Pro Arg  
355 360 365

Glu Ser Met Glu Lys Thr Ile Leu Glu Gly Tyr Glu Ile Arg Pro Arg  
370 375 380

Thr Ile Val His Val Asn Ala Trp Ala Ile Ala Arg Asp Pro Glu Ile  
385 390 395 400

Trp Glu Asn Pro Asp Glu Phe Ile Pro Glu Arg Phe Leu Asn Ser Ser  
405 410 415

Ile Asp Tyr Lys Gly Gln Asp Phe Glu Leu Leu Pro Phe Gly Ala Gly  
420 425 430

Arg Arg Gly Cys Pro Gly Ile Ala Leu Gly Val Ala Ser Met Glu Leu  
435 440 445

Ala Leu Ser Asn Leu Leu Tyr Ala Phe Asp Trp Glu Leu Pro Tyr Gly  
450 455 460

Val Lys Lys Glu Asp Ile Asp Thr Asn Val Arg Pro Gly Ile Ala Met  
465 470 475 480

His Lys Lys Asn Glu Leu Cys Leu Val Pro Lys Lys Leu Phe Ile Asn  
485 490 495

Tyr Ile Gly Thr Trp Ile Ser Cys  
500

<210> 259  
<211> 1615  
<212> DNA  
<213> NICOTIANATABACUM

<400> 259  
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aggtacaaac ttgactacat atgcagcagt atttcttgat actctgtttc ttttgttcct 120  
ttccaaactt cttcgccaga ggaaactcaa ttacctcca ggcccaaac catggccgat 180  
catcggaac ttaaactta ttggcaatct tcctcatcgc tcaatccacg aactctcct 240

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caagtacgga cccgttatgc aactccaatt cgggtctttc cccgttgtag ttggatcctc 300
cgtcgaaatg gctaagattt tcctcaaadc catggatatt aactttgtag gcaggcctaa 360
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cgattcatac gagtatattc gggctgagga gttgcattct cttctccata atttgaacaa 540
aatatcaggg aaaccaattg tgttgaaaga ttatttgacg acgttgagtt taaatgttat 600
tagcaggatg gtactgggga aaaggatatt ggacgaatcc gagaactcgt tcgtgaatcc 660
tgaggaattt aagaagatgt tggacgaatt gtttttgcta aatgggtgtac ttaatatggg 720
agattcaatt ccatggattg atttcatgga tttgcaaggt tatgttaaga ggatgaaagt 780
agtgagcaag aaattcgaca agttttttaga gcatgttatt gatgagcata acattaggag 840
aaatggagtg gagaattatg ttgctaagga tatgggtggat gttttgttgc agcttgctga 900
tgatccgaag ttggaagtta agctggagag acatggagtc aaagcattca ctcaggatat 960
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gatttttggg ctctctacac ctaaaaaatt tccacttgct actgtgattg agccaagact 1560
ttcacaaaaa ctttactctg tttgattcag cagttctatg gttccgtcaa gatag 1615

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&lt;210&gt; 260

&lt;211&gt; 509

&lt;212&gt; PRT

&lt;213&gt; NICOTIANATABACUM

&lt;400&gt; 260

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Met Glu Gly Thr Asn Leu Thr Thr Tyr Ala Ala Val Phe Leu Asp Thr
1           5           10          15

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Leu Phe Leu Leu Phe Leu Ser Lys Leu Leu Arg Gln Arg Lys Leu Asn
20          25          30

```

```

Leu Pro Pro Gly Pro Lys Pro Trp Pro Ile Ile Gly Asn Leu Asn Leu
Page 217

```

35

40

45

Ile Gly Asn Leu Pro His Arg Ser Ile His Glu Leu Ser Leu Lys Tyr  
 50 55 60

Gly Pro Val Met Gln Leu Gln Phe Gly Ser Phe Pro Val Val Val Gly  
 65 70 75 80

Ser Ser Val Glu Met Ala Lys Ile Phe Leu Lys Ser Met Asp Ile Asn  
 85 90 95

Phe Val Gly Arg Pro Lys Thr Ala Ala Gly Lys Tyr Thr Thr Tyr Asn  
 100 105 110

Tyr Ser Asp Ile Thr Trp Ser Pro Tyr Gly Pro Tyr Trp Arg Gln Ala  
 115 120 125

Arg Arg Met Cys Leu Thr Glu Leu Phe Ser Thr Lys Arg Leu Asp Ser  
 130 135 140

Tyr Glu Tyr Ile Arg Ala Glu Glu Leu His Ser Leu Leu His Asn Leu  
 145 150 155 160

Asn Lys Ile Ser Gly Lys Pro Ile Val Leu Lys Asp Tyr Leu Thr Thr  
 165 170 175

Leu Ser Leu Asn Val Ile Ser Arg Met Val Leu Gly Lys Arg Tyr Leu  
 180 185 190

Asp Glu Ser Glu Asn Ser Phe Val Asn Pro Glu Glu Phe Lys Lys Met  
 195 200 205

Leu Asp Glu Leu Phe Leu Leu Asn Gly Val Leu Asn Ile Gly Asp Ser  
 210 215 220

Ile Pro Trp Ile Asp Phe Met Asp Leu Gln Gly Tyr Val Lys Arg Met  
 225 230 235 240

Lys Val Val Ser Lys Lys Phe Asp Lys Phe Leu Glu His Val Ile Asp  
 245 250 255

Glu His Asn Ile Arg Arg Asn Gly Val Glu Asn Tyr Val Ala Lys Asp  
 260 265 270

Met Val Asp Val Leu Leu Gln Leu Ala Asp Asp Pro Lys Leu Glu Val  
 275 280 285

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Lys Leu Glu Arg His Gly Val Lys Ala Phe Thr Gln Asp Met Leu Ala  
 290 295 300

Gly Gly Thr Glu Ser Ser Ala Val Thr Val Glu Trp Ala Ile Ser Glu  
 305 310 315 320

Leu Leu Lys Lys Pro Glu Ile Phe Lys Lys Ala Thr Glu Glu Leu Asp  
 325 330 335

Arg Val Ile Gly Gln Asn Arg Trp Val Gln Glu Lys Asp Ile Pro Asn  
 340 345 350

Leu Pro Tyr Ile Glu Ala Ile Val Lys Glu Thr Met Arg Leu His Pro  
 355 360 365

Val Ala Pro Met Leu Val Pro Arg Glu Cys Arg Glu Asp Ile Lys Val  
 370 375 380

Ala Gly Tyr Asp Val Gln Lys Gly Thr Arg Val Leu Val Ser Val Trp  
 385 390 395 400

Thr Ile Gly Arg Asp Pro Thr Leu Trp Asp Glu Pro Glu Val Phe Lys  
 405 410 415

Pro Glu Arg Phe His Glu Lys Ser Ile Asp Val Lys Gly His Asp Tyr  
 420 425 430

Glu Leu Leu Pro Phe Gly Ala Gly Arg Arg Met Cys Pro Gly Tyr Ser  
 435 440 445

Leu Gly Leu Lys Val Ile Gln Ala Ser Leu Ala Asn Leu Leu His Gly  
 450 455 460

Phe Asn Trp Ser Leu Pro Asp Asn Met Thr Pro Glu Asp Leu Asn Met  
 465 470 475 480

Asp Glu Ile Phe Gly Leu Ser Thr Pro Lys Lys Phe Pro Leu Ala Thr  
 485 490 495

Val Ile Glu Pro Arg Leu Ser Pro Lys Leu Tyr Ser Val  
 500 505

<210> 261

<211> 1610

<212> DNA

<213> NICOTIANATABACUM

<400> 261

cttcttcctt cctaactaaa aatggagatt cagttttcta acttagttgc attcttgctc

60

## 79601-7270 Sequence Listing v2 -03-25-04.ST25

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tttctctcca gcatctttct tgtattcaaa aaatggaaaa ccagaaaact aaatttgcct 120
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cttcctcacc atggcctaaa aaatttagcc aaacgctatg gtcctcttat gcatttacaa 240
cttggacaaa ttcctacact cgtcatatca tcacctcaaa tggcaaaaga agtactaaaa 300
actcacgacc tcgcttttgc cactagacca aagcttgtcg tggccgacat cattcactac 360
gacagcacgg acatagcact ttcgccatac ggtgaatact ggagacaaat tcgtaaaatt 420
tgcatattgg aactcttgag tgccaagatg gtcaagtttt ttagctcgat tcgccaagat 480
gagctctcga agatggtttc atctatacga acgacgcca atcttccagt caatcttacc 540
gacaagattt tttggtttac gagttcgga attttagat cagctttagg gaagatatgt 600
ggtgaccaag acaaattgat catTTTTatg agggaaataa tatcattggc aggtggattt 660
agtattgctg atTTTTtccc tacatggaaa atgattcatg atattgatgg ttcaaaatct 720
aaactggtga aggcacatcg taagattgat gaaattttgg aaaatgtggt aaatgagcac 780
aaacagaatc gagcagatgg taaaaaggg aatggtgaat ttggtggaga agatctgatt 840
gatgttttgt taagagttag agaaagtgga gaagttcaaa ttccaatcac agatgacaat 900
atcaaatcaa tattaatcga catgttctct gccggatcgg aaacatcatc gacaactata 960
atttgggcat tagctgaaat gatgaagaaa ccaagtgttt tagcaaaggc acaagctgaa 1020
gtgagccaag ctttgaaggg gaagaaaatt agttttcaag agattgatat tgataagcta 1080
aagtatttga agttagtgat caaagaaact ttaagaatgc accctccaat tcctctgtta 1140
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tttattccat ttggtgcagg aagaaggatt tgcctggaa tgctatttgg tttagctaata 1380
gttggaacac ctttagctca gttactttat cacttcgatt ggaaactccc taatggacaa 1440
actcacaaa atttcgacat gactgagtca cctggaattt ctgctacaag aaaggatgat 1500
cttattttga ttgccactcc tgctattct tgattaagta ttgctgctt tctattggag 1560
aatTTTcaaa attcatccac aatatatagt gtttgctaga gttggttagc 1610

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<210> 262
<211> 503
<212> PRT
<213> NICOTIANATABACUM

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```

<400> 262

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Met Glu Ile Gln Phe Ser Asn Leu Val Ala Phe Leu Leu Phe Leu Ser
1           5           10           15

```



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Ser Ile Phe Leu Val Phe Lys Lys Trp Lys Thr Arg Lys Leu Asn Leu  
20 25 30

Pro Pro Gly Pro Trp Lys Leu Pro Phe Ile Gly Ser Leu His His Leu  
35 40 45

Ala Val Ala Gly Pro Leu Pro His His Gly Leu Lys Asn Leu Ala Lys  
50 55 60

Arg Tyr Gly Pro Leu Met His Leu Gln Leu Gly Gln Ile Pro Thr Leu  
65 70 75 80

Val Ile Ser Ser Pro Gln Met Ala Lys Glu Val Leu Lys Thr His Asp  
85 90 95

Leu Ala Phe Ala Thr Arg Pro Lys Leu Val Val Ala Asp Ile Ile His  
100 105 110

Tyr Asp Ser Thr Asp Ile Ala Leu Ser Pro Tyr Gly Glu Tyr Trp Arg  
115 120 125

Gln Ile Arg Lys Ile Cys Ile Leu Glu Leu Leu Ser Ala Lys Met Val  
130 135 140

Lys Phe Phe Ser Ser Ile Arg Gln Asp Glu Leu Ser Lys Met Val Ser  
145 150 155 160

Ser Ile Arg Thr Thr Pro Asn Leu Pro Val Asn Leu Thr Asp Lys Ile  
165 170 175

Phe Trp Phe Thr Ser Ser Val Ile Cys Arg Ser Ala Leu Gly Lys Ile  
180 185 190

Cys Gly Asp Gln Asp Lys Leu Ile Ile Phe Met Arg Glu Ile Ile Ser  
195 200 205

Leu Ala Gly Gly Phe Ser Ile Ala Asp Phe Phe Pro Thr Trp Lys Met  
210 215 220

Ile His Asp Ile Asp Gly Ser Lys Ser Lys Leu Val Lys Ala His Arg  
225 230 235 240

Lys Ile Asp Glu Ile Leu Glu Asn Val Val Asn Glu His Lys Gln Asn  
245 250 255

Arg Ala Asp Gly Lys Lys Gly Asn Gly Glu Phe Gly Gly Glu Asp Leu  
Page 221

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260

265

270

Ile Asp Val Leu Leu Arg Val Arg Glu Ser Gly Glu Val Gln Ile Pro  
 275 280 285

Ile Thr Asp Asp Asn Ile Lys Ser Ile Leu Ile Asp Met Phe Ser Ala  
 290 295 300

Gly Ser Glu Thr Ser Ser Thr Thr Ile Ile Trp Ala Leu Ala Glu Met  
 305 310 315 320

Met Lys Lys Pro Ser Val Leu Ala Lys Ala Gln Ala Glu Val Ser Gln  
 325 330 335

Ala Leu Lys Gly Lys Lys Ile Ser Phe Gln Glu Ile Asp Ile Asp Lys  
 340 345 350

Leu Lys Tyr Leu Lys Leu Val Ile Lys Glu Thr Leu Arg Met His Pro  
 355 360 365

Pro Ile Pro Leu Leu Val Pro Arg Glu Cys Met Glu Asp Thr Lys Ile  
 370 375 380

Asp Gly Tyr Asn Ile Pro Phe Lys Thr Arg Val Ile Val Asn Ala Trp  
 385 390 395 400

Ala Ile Gly Arg Asp Pro Gln Ser Trp Asp Asp Pro Glu Ser Phe Thr  
 405 410 415

Pro Glu Arg Phe Glu Asn Asn Ser Ile Asp Phe Leu Gly Asn His His  
 420 425 430

Gln Phe Ile Pro Phe Gly Ala Gly Arg Arg Ile Cys Pro Gly Met Leu  
 435 440 445

Phe Gly Leu Ala Asn Val Gly Gln Pro Leu Ala Gln Leu Leu Tyr His  
 450 455 460

Phe Asp Trp Lys Leu Pro Asn Gly Gln Thr His Gln Asn Phe Asp Met  
 465 470 475 480

Thr Glu Ser Pro Gly Ile Ser Ala Thr Arg Lys Asp Asp Leu Ile Leu  
 485 490 495

Ile Ala Thr Pro Ala His Ser  
 500

## 79601-7270 Sequence Listing v2 -03-25-04.ST25

<210> 263  
 <211> 1611  
 <212> DNA  
 <213> NICOTIANATABACUM

<400> 263  
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 agaaactgga gagttgcctc agaaaacagg gactcaaagg aaattcctac gggctatttct 180  
 atggagatat gaaagaattg tccaaaagtc tcaaggaaat caattcaaag cccatcatca 240  
 atctatcaaa tgaagtagcc ccaagaatca ttccttatta tcttgaaatc atccaaaaat 300  
 atggtaaaag atgttttgtt tggcaaggac caacccccgc aatattaata acagagccag 360  
 aattaataaa ggagatattt ggtaagaact atgtttttca gaagcctaata aatcccaacc 420  
 cactgaccaa gttattggct cgagggtgtg taagctacga ggaagaaaaa tgggcaaaac 480  
 acagaaagat cttaaattcct gcctttcata tggagaagtt gaagcatatg ctaccagcat 540  
 tttacttgag ctgtagtgag atgctgaaca aatgggagga gattatccca gtaaaagaat 600  
 caaatgagtt ggacatttgg cctcatcttc aaagaatgac aagtgatgtg atttctcgtg 660  
 ctgccttttg tagtagctac gaagaaggaa gaagaatatt tgaacttcaa gaagaacaag 720  
 ctgagtatct aacgaagaca ttcaattcag tttatatccc aggttccaga ttttttccca 780  
 ataaaatgaa caaaagaatg aaagaatgtg aaaaggaagt acgagaaaca attacgtgtc 840  
 taattgacaa cagattaaag gcaaaagaag aaggcaatgg caaggccctc aatgatgacc 900  
 tattgggtat attattagag tcaaattcta tagaaattga agaacatggt aacaagaagt 960  
 ttggaatgag tataacctgaa gtaattgaag agtgcaaatt attctatttt gctggccaag 1020  
 agactacatc agtattgctt gtgtggacac tgattttgtt agggagaaat ccagaatggc 1080  
 aggaacgtgc tagagaggaa gtttttcaag cctttggaag tgataaacca acttttgacg 1140  
 aattatatcg cttgaaaatt gtgacgatga ttttgtacga gtctttaagg ttatatccac 1200  
 caatagcaac tcgtactcga aggactaatg aagaaacaaa attaggggaa ctagatttac 1260  
 caaagggtgc actgctcttt ataccaacaa tcttattaca tcttgacagg gaaatttggg 1320  
 gtgaagatgc agatgagttc aatccggaga gatttagcga aggggtggca aaggcaacaa 1380  
 aggggaaaat gacatatttt ccatttgggtg caggaccgcg aaaatgcatt gggcaaaact 1440  
 tcgcgatttt ggaagcaaaa atggctatag ctatgattct acaacgcttc tccttcgagc 1500  
 tctctccatc ttatacacac tctccataca ctgtggtcac tttgaaaccc aaatatggtg 1560  
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<210> 264  
 <211> 521

## 79601-7270 Sequence Listing v2 -03-25-04.ST25

&lt;212&gt; PRT

&lt;213&gt; NICOTIANATABACUM

&lt;400&gt; 264

Met Gly Asn Ala His Asn Ser Lys Ile Ala Ala Ile Cys Leu Ile Ile  
 1 5 10 15

Phe Leu Val Tyr Lys Ala Trp Glu Leu Leu Lys Trp Ile Trp Ile Lys  
 20 25 30

Pro Lys Lys Leu Glu Ser Cys Leu Arg Lys Gln Gly Leu Lys Gly Asn  
 35 40 45

Ser Tyr Gly Leu Phe Tyr Gly Asp Met Lys Glu Leu Ser Lys Ser Leu  
 50 55 60

Lys Glu Ile Asn Ser Lys Pro Ile Ile Asn Leu Ser Asn Glu Val Ala  
 65 70 75 80

Pro Arg Ile Ile Pro Tyr Tyr Leu Glu Ile Ile Gln Lys Tyr Gly Lys  
 85 90 95

Arg Cys Phe Val Trp Gln Gly Pro Thr Pro Ala Ile Leu Ile Thr Glu  
 100 105 110

Pro Glu Leu Ile Lys Glu Ile Phe Gly Lys Asn Tyr Val Phe Gln Lys  
 115 120 125

Pro Asn Asn Pro Asn Pro Leu Thr Lys Leu Leu Ala Arg Gly Val Val  
 130 135 140

Ser Tyr Glu Glu Glu Lys Trp Ala Lys His Arg Lys Ile Leu Asn Pro  
 145 150 155 160

Ala Phe His Met Glu Lys Leu Lys His Met Leu Pro Ala Phe Tyr Leu  
 165 170 175

Ser Cys Ser Glu Met Leu Asn Lys Trp Glu Glu Ile Ile Pro Val Lys  
 180 185 190

Glu Ser Asn Glu Leu Asp Ile Trp Pro His Leu Gln Arg Met Thr Ser  
 195 200 205

Asp Val Ile Ser Arg Ala Ala Phe Gly Ser Ser Tyr Glu Glu Gly Arg  
 210 215 220

Arg Ile Phe Glu Leu Gln Glu Glu Gln Ala Glu Tyr Leu Thr Lys Thr  
 225 230 235 240

79601-7270 Sequence Listing v2 -03-25-04.ST25

Phe Asn Ser Val Tyr Ile Pro Gly Ser Arg Phe Phe Pro Asn Lys Met  
 245 250 255  
 Asn Lys Arg Met Lys Glu Cys Glu Lys Glu Val Arg Glu Thr Ile Thr  
 260 265 270  
 Cys Leu Ile Asp Asn Arg Leu Lys Ala Lys Glu Glu Gly Asn Gly Lys  
 275 280 285  
 Ala Leu Asn Asp Asp Leu Leu Gly Ile Leu Leu Glu Ser Asn Ser Ile  
 290 295 300  
 Glu Ile Glu Glu His Gly Asn Lys Lys Phe Gly Met Ser Ile Pro Glu  
 305 310 315 320  
 Val Ile Glu Glu Cys Lys Leu Phe Tyr Phe Ala Gly Gln Glu Thr Thr  
 325 330 335  
 Ser Val Leu Leu Val Trp Thr Leu Ile Leu Leu Gly Arg Asn Pro Glu  
 340 345 350  
 Trp Gln Glu Arg Ala Arg Glu Glu Val Phe Gln Ala Phe Gly Ser Asp  
 355 360 365  
 Lys Pro Thr Phe Asp Glu Leu Tyr Arg Leu Lys Ile Val Thr Met Ile  
 370 375 380  
 Leu Tyr Glu Ser Leu Arg Leu Tyr Pro Pro Ile Ala Thr Arg Thr Arg  
 385 390 395 400  
 Arg Thr Asn Glu Glu Thr Lys Leu Gly Glu Leu Asp Leu Pro Lys Gly  
 405 410 415  
 Ala Leu Leu Phe Ile Pro Thr Ile Leu Leu His Leu Asp Arg Glu Ile  
 420 425 430  
 Trp Gly Glu Asp Ala Asp Glu Phe Asn Pro Glu Arg Phe Ser Glu Gly  
 435 440 445  
 Val Ala Lys Ala Thr Lys Gly Lys Met Thr Tyr Phe Pro Phe Gly Ala  
 450 455 460  
 Gly Pro Arg Lys Cys Ile Gly Gln Asn Phe Ala Ile Leu Glu Ala Lys  
 465 470 475 480  
 Met Ala Ile Ala Met Ile Leu Gln Arg Phe Ser Phe Glu Leu Ser Pro  
 Page 225

Ser Tyr Thr His Ser Pro Tyr Thr Val Val Thr Leu Lys Pro Lys Tyr  
500 505 510

Gly Ala Pro Leu Ile Met His Arg Leu  
515 520

<210> 265  
<211> 1570  
<212> DNA  
<213> NICOTIANATABACUM

<400> 265  
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caccaggtcc aaaacatgg cccatcattg gcaatttgaa cctacttggt cctataccac 180  
atcaatcttt tgacttgctt tccaaaaaat atggagagtt gatgctgctg aaatttggct 240  
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atgctaattt cgcctcccgt cctatgctag ctgggtggaaa gtatacaagc tataactatt 360  
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accagatatt tactccgaaa aggctagact cgttcgagta cattcgtggt gaagaaaggc 480  
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tgtcgcgatt tagcctctgc agcatgacaa ggatgggttt gagcaacaag tattttggtg 600  
aatcaacagt tagagtagaa gatttgcagt acctggtaga tcaatgggtc ttacttaatg 660  
gtgctttcaa cattggagat tggattccat ggctcagctt cttggaccta caaggctatg 720  
tgaaacaaat gaaggctttg aaaagaactt ttgataagtt ccacaacatt gtgctagatg 780  
atcacagggc taagaagaat gcagagaaga actttgtccc aaaagacatg gttgatgtct 840  
tgttgaagat ggctgaagat cctaactctg aagtcaaact cactaatgac tgtgtcaaag 900  
ggttaatgca ggatttacta actggaggaa cagatagctt aacagcagca gtgcaatggg 960  
catttcaaga acttcttaga cagccaaggg ttattgagaa ggcaaccgaa gagcttgacc 1020  
ggattgtcgg gaaagagaga tgggtagaag agaaagattg ctcgcagcta tcttacgttg 1080  
aagcaatcct caaggaaaca ctaaggttac atcctctagg aactatgcta gcaccgcatt 1140  
gtgctataga agattgtaac gtggctgggt atgacataca gaaaggaacg acctttctgg 1200  
tgaatgtttg gaccattgga agggacccaa aatactggga tagagcacia gagtttctcc 1260  
ccgagagatt tttagagaac gacattgata tggacggaca taactttgct ttcttgccat 1320  
ttggctcggg gcgaaggagg tgccctggct atagccttgg acttaagggt atccgagtaa 1380

## 79601-7270 Sequence Listing v2 -03-25-04.ST25

cattagccaa catgttgcac ggattcaact ggaaattacc tgaaggatatg aagccagaag 1440  
 atataagtgt ggaagaacat tatgggctca ctacacatcc taagtttcct gttcctgtga 1500  
 tcttggaatc tagactttct tcagatctct attcccccat cacttaatcc taagtgcctc 1560  
 ctattatagc 1570

<210> 266  
 <211> 508  
 <212> PRT  
 <213> NICOTIANATABACUM

<400> 266

Met Glu Asn Ser Trp Val Phe Leu Ala Leu Ala Gly Leu Ser Ala Leu  
 1 5 10 15

Ala Phe Leu Cys Lys Ile Ile Thr Cys Arg Arg Pro Val Asn Arg Lys  
 20 25 30

Ile Pro Pro Gly Pro Lys Pro Trp Pro Ile Ile Gly Asn Leu Asn Leu  
 35 40 45

Leu Gly Pro Ile Pro His Gln Ser Phe Asp Leu Leu Ser Lys Lys Tyr  
 50 55 60

Gly Glu Leu Met Leu Leu Lys Phe Gly Ser Arg Pro Val Leu Val Ala  
 65 70 75 80

Ser Ser Ala Glu Met Ala Lys Gln Phe Leu Lys Val His Asp Ala Asn  
 85 90 95

Phe Ala Ser Arg Pro Met Leu Ala Gly Gly Lys Tyr Thr Ser Tyr Asn  
 100 105 110

Tyr Cys Asp Met Thr Trp Ala Pro Tyr Gly Pro Tyr Trp Arg Gln Ala  
 115 120 125

Arg Arg Ile Tyr Leu Asn Gln Ile Phe Thr Pro Lys Arg Leu Asp Ser  
 130 135 140

Phe Glu Tyr Ile Arg Val Glu Glu Arg Gln Ala Leu Ile Ser Gln Leu  
 145 150 155 160

Asn Ser Leu Ala Gly Lys Pro Phe Phe Leu Lys Asp His Leu Ser Arg  
 165 170 175

Phe Ser Leu Cys Ser Met Thr Arg Met Val Leu Ser Asn Lys Tyr Phe  
 180 185 190

79601-7270 Sequence Listing v2 -03-25-04.ST25

Gly Glu Ser Thr Val Arg Val Glu Asp Leu Gln Tyr Leu Val Asp Gln  
195 200 205

Trp Phe Leu Leu Asn Gly Ala Phe Asn Ile Gly Asp Trp Ile Pro Trp  
210 215 220

Leu Ser Phe Leu Asp Leu Gln Gly Tyr Val Lys Gln Met Lys Ala Leu  
225 230 235 240

Lys Arg Thr Phe Asp Lys Phe His Asn Ile Val Leu Asp Asp His Arg  
245 250 255

Ala Lys Lys Asn Ala Glu Lys Asn Phe Val Pro Lys Asp Met Val Asp  
260 265 270

Val Leu Leu Lys Met Ala Glu Asp Pro Asn Leu Glu Val Lys Leu Thr  
275 280 285

Asn Asp Cys Val Lys Gly Leu Met Gln Asp Leu Leu Thr Gly Gly Thr  
290 295 300

Asp Ser Leu Thr Ala Ala Val Gln Trp Ala Phe Gln Glu Leu Leu Arg  
305 310 315 320

Gln Pro Arg Val Ile Glu Lys Ala Thr Glu Glu Leu Asp Arg Ile Val  
325 330 335

Gly Lys Glu Arg Trp Val Glu Glu Lys Asp Cys Ser Gln Leu Ser Tyr  
340 345 350

Val Glu Ala Ile Leu Lys Glu Thr Leu Arg Leu His Pro Leu Gly Thr  
355 360 365

Met Leu Ala Pro His Cys Ala Ile Glu Asp Cys Asn Val Ala Gly Tyr  
370 375 380

Asp Ile Gln Lys Gly Thr Thr Phe Leu Val Asn Val Trp Thr Ile Gly  
385 390 395 400

Arg Asp Pro Lys Tyr Trp Asp Arg Ala Gln Glu Phe Leu Pro Glu Arg  
405 410 415

Phe Leu Glu Asn Asp Ile Asp Met Asp Gly His Asn Phe Ala Phe Leu  
420 425 430

Pro Phe Gly Ser Gly Arg Arg Arg Cys Pro Gly Tyr Ser Leu Gly Leu  
435 440 445



## 79601-7270 Sequence Listing v2 -03-25-04.ST25

Lys Val Ile Arg Val Thr Leu Ala Asn Met Leu His Gly Phe Asn Trp  
 450 455 460

Lys Leu Pro Glu Gly Met Lys Pro Glu Asp Ile Ser Val Glu Glu His  
 465 470 475 480

Tyr Gly Leu Thr Thr His Pro Lys Phe Pro Val Pro Val Ile Leu Glu  
 485 490 495

Ser Arg Leu Ser Ser Asp Leu Tyr Ser Pro Ile Thr  
 500 505

<210> 267  
 <211> 1617  
 <212> DNA  
 <213> NICOTIANATABACUM

<400> 267  
 cacattgagt cctctcccaa atcactgatt caccaccaa agtaccaaca attcaatgga 60  
 aggtacaaac ttgactacat atgcagcagt atttcttgat actctgtttc ttttgttcct 120  
 ttccaaactt cttcgccaga ggaaactcaa ttacctcca ggcccaaac catggccgat 180  
 catcggaac ttaaacctta ttggcaatct tcctcatcgc tcaatccacg aactctccct 240  
 caagtacgga cccgttatgc aactccaatt cgggtctttc cccgttgtag ttggatcctc 300  
 cgtcgaaatg gctaagattt tcctcaaadc catggatatt aactttgtag gcaggcctaa 360  
 aacggctgcc ggaaaataca caacgtacaa ttattccgat attacatggg ctccttacgg 420  
 accatattgg cgccaggcac gtaggatgtg cctaacggaa ttattcagca cgaaacgtct 480  
 cgattcatac gagtatattc gggctgagga gttgcattct cttctccata atttgaacaa 540  
 aatatcaggg aaaccaattg tgttgaaaga ttatttgacg acgttgagtt taaatgttat 600  
 tagcaggatg gtactgggga aaaggatatt ggacgaatcc gagaactcgt tcgtgaatcc 660  
 tgaggaattt aagaagatgt tggacgaatt gtttttgcta aatggtgtac ttaatatggg 720  
 agattcaatt ccatggattg atttcatgga ttgcaagggt tatgttaaga ggatgaaagt 780  
 agtgagcaag aaattcgaca agtttttaga gcatgttatt gatgagcata acattaggag 840  
 aaatggagtg gagaattatg ttgctaagga tatggtggat gttttgttgc agcttgctga 900  
 tgatccgaag ttggaagtta agctggagag acatggagtc aaagcattca ctcaggatat 960  
 gctggctggg ggaaccgaga gttcagcagt gacagtggag tgggcaattt cagagctgct 1020  
 aaagaagccg gagattttca aaaaggctac agaagaattg gatcgagtaa ttgggcagaa 1080  
 tagatgggta caagaaaagg acattccaaa tcaccttac atagaggcaa tagtcaaaga 1140  
 gactatgcga ctgcaccccg tggcaccaat gttggtgcca cgtgagtgtc gagaagatat 1200

## 79601-7270 Sequence Listing v2 -03-25-04.ST25

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taaggttagca ggctacgacg ttcagaaagg aactaggggt ctcgtgagtg tatggactat 1260
tggaagagac cctacattgt gggacgagcc tgaggtgttc aagccggaga gattccatga 1320
aaagtccata gatgttaaag gacatgatta tgagcttttg ccatttggag cggggagaag 1380
aatgtgcccc gggtatagct tggggctcaa ggtgattcaa gctagcttag ctaatcttct 1440
acatggattt aactggtcac tgcctgataa tatgactcct gaggacctca acatggatga 1500
gatttttggg ctctctacac ctaaaaaatt tccacttgct actgtgattg agccaagact 1560
ttcaccaaaa ctttactctg tttgattcag cagttctatg gatccgtcaa gatagac 1617

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&lt;210&gt; 268

&lt;211&gt; 509

&lt;212&gt; PRT

&lt;213&gt; NICOTIANATABACUM

&lt;400&gt; 268

Met Glu Gly Thr Asn Leu Thr Thr Tyr Ala Ala Val Phe Leu Asp Thr  
1 5 10 15

Leu Phe Leu Leu Phe Leu Ser Lys Leu Leu Arg Gln Arg Lys Leu Asn  
20 25 30

Leu Pro Pro Gly Pro Lys Pro Trp Pro Ile Ile Gly Asn Leu Asn Leu  
35 40 45

Ile Gly Asn Leu Pro His Arg Ser Ile His Glu Leu Ser Leu Lys Tyr  
50 55 60

Gly Pro Val Met Gln Leu Gln Phe Gly Ser Phe Pro Val Val Val Gly  
65 70 75 80

Ser Ser Val Glu Met Ala Lys Ile Phe Leu Lys Ser Met Asp Ile Asn  
85 90 95

Phe Val Gly Arg Pro Lys Thr Ala Ala Gly Lys Tyr Thr Thr Tyr Asn  
100 105 110

Tyr Ser Asp Ile Thr Trp Ser Pro Tyr Gly Pro Tyr Trp Arg Gln Ala  
115 120 125

Arg Arg Met Cys Leu Thr Glu Leu Phe Ser Thr Lys Arg Leu Asp Ser  
130 135 140

Tyr Glu Tyr Ile Arg Ala Glu Glu Leu His Ser Leu Leu His Asn Leu  
145 150 155 160

## 79601-7270 Sequence Listing v2 -03-25-04.ST25

Asn Lys Ile Ser Gly Lys Pro Ile Val Leu Lys Asp Tyr Leu Thr Thr  
 165 170 175  
 Leu Ser Leu Asn Val Ile Ser Arg Met Val Leu Gly Lys Arg Tyr Leu  
 180 185 190  
 Asp Glu Ser Glu Asn Ser Phe Val Asn Pro Glu Glu Phe Lys Lys Met  
 195 200 205  
 Leu Asp Glu Leu Phe Leu Leu Asn Gly Val Leu Asn Ile Gly Asp Ser  
 210 215 220  
 Ile Pro Trp Ile Asp Phe Met Asp Leu Gln Gly Tyr Val Lys Arg Met  
 225 230 235 240  
 Lys Val Val Ser Lys Lys Phe Asp Lys Phe Leu Glu His Val Ile Asp  
 245 250 255  
 Glu His Asn Ile Arg Arg Asn Gly Val Glu Asn Tyr Val Ala Lys Asp  
 260 265 270  
 Met Val Asp Val Leu Leu Gln Leu Ala Asp Asp Pro Lys Leu Glu Val  
 275 280 285  
 Lys Leu Glu Arg His Gly Val Lys Ala Phe Thr Gln Asp Met Leu Ala  
 290 295 300  
 Gly Gly Thr Glu Ser Ser Ala Val Thr Val Glu Trp Ala Ile Ser Glu  
 305 310 315 320  
 Leu Leu Lys Lys Pro Glu Ile Phe Lys Lys Ala Thr Glu Glu Leu Asp  
 325 330 335  
 Arg Val Ile Gly Gln Asn Arg Trp Val Gln Glu Lys Asp Ile Pro Asn  
 340 345 350  
 His Pro Tyr Ile Glu Ala Ile Val Lys Glu Thr Met Arg Leu His Pro  
 355 360 365  
 Val Ala Pro Met Leu Val Pro Arg Glu Cys Arg Glu Asp Ile Lys Val  
 370 375 380  
 Ala Gly Tyr Asp Val Gln Lys Gly Thr Arg Val Leu Val Ser Val Trp  
 385 390 395 400  
 Thr Ile Gly Arg Asp Pro Thr Leu Trp Asp Glu Pro Glu Val Phe Lys  
 405 410 415

79601-7270 Sequence Listing v2 -03-25-04.ST25

Pro Glu Arg Phe His Glu Lys Ser Ile Asp Val Lys Gly His Asp Tyr  
420 425 430

Glu Leu Leu Pro Phe Gly Ala Gly Arg Arg Met Cys Pro Gly Tyr Ser  
435 440 445

Leu Gly Leu Lys Val Ile Gln Ala Ser Leu Ala Asn Leu Leu His Gly  
450 455 460

Phe Asn Trp Ser Leu Pro Asp Asn Met Thr Pro Glu Asp Leu Asn Met  
465 470 475 480

Asp Glu Ile Phe Gly Leu Ser Thr Pro Lys Lys Phe Pro Leu Ala Thr  
485 490 495

Val Ile Glu Pro Arg Leu Ser Pro Lys Leu Tyr Ser Val  
500 505

<210> 269  
<211> 1657  
<212> DNA  
<213> NICOTIANATABACUM

<400> 269  
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tatttctttc cattttcaag ctcttttagg gcttttagcc tttgtgttct tgtctattat 120  
cttatggaga agaacactca cttcaagaaa attagcccct gaaatcccag gggcatggcc 180  
tattataggc catcttcgtc agctgagtgg tactgataag aatatcccat ttccccgaat 240  
attgggcgct ttggcagata aatatggacc tgtcttcaca ctgagaatag ggatgtaccc 300  
ctatttgatt gtcaacaatt gggaagcagc taaggattgt ctcaaacgc atgataagga 360  
cttcgctgcc cgaccaactt ctatggctgg tgaaagcatc ggtacaagt atgcgagggt 420  
tacttatgct aattttggtc cttattataa ccaagtgcgc aaactagccc tacaacatgt 480  
actctcgagt actaaactcg agaaaatgaa acacatacgt gtttctgaat tggaaactag 540  
catcaaagaa ttatatctt tgacgctggg caaaaacaac atgcaaaaag tgaatataag 600  
taaatggttt gaacaattga ctttaacat aatcgtgaag acaatttgtg gcaagagata 660  
tagcaacata gaggaggatg aagaggcaca acgtttcaga aaggcattta agggcatcat 720  
gtttgttgta gggcaaattg ttttatatga cgcaattcca ttcccattgt tcaaatactt 780  
tgatttccaa ggtcatatac aattgatgaa caaaatttat aaagacttag attctattct 840  
tcaaggatgg ttggatgatc atatgatgaa caaggatgta aacaataagg atcaagatgc 900  
catagatgcc atgcttaagg taacacaact taatgaattc aaagcctatg gtttttctca 960

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ggccactgtg atcaagtcga cagtcttgag ttgatctta gatggaaatg acacaaccgc 1020
tggtcatttg atatgggtaa tgccttatt actgaacaat ccacatgtta tgaaacaagg 1080
ccaagaagag atagacatga aagtgggtaa agagagggtg attgaagata ctgacataaa 1140
aaatttagtg taccttcagg ctatcgtaa agagacattg cgcttgatc cacctgttcc 1200
ttttcttta ccacacgaag cagtgaaga ttgtaaagt actgggtacc acattcctaa 1260
aggctactcg ctatatatca atgcgtggaa agtacatcgc gattctgaaa ttgggtcaga 1320
gcccgaagg tttatgccca atagattctt gactagcaaa gcaaatatag atgctcgcgg 1380
tcaaaat ttt gaatttatac cgtttggttc tgggagacgg tcatgtccag ggtaggttt 1440
tgcgacttta gtgacacatc tgacttttgg tcgcttgctt caaggttttg attttagtaa 1500
gccatcaaac acgccaattg acatgacaga aggcgtaggc gttactttgc ctaagggttaa 1560
tcaagttgaa gttctaatta cccctcgttt accttctaag ctttatttat ttgaaagtg 1620
caaatcatca atcatgggtt gagtaattag tgatact 1657

```

<210> 270  
 <211> 521  
 <212> PRT  
 <213> NICOTIANATABACUM

<400> 270

Met Asp Tyr His Ile Ser Phe His Phe Gln Ala Leu Leu Gly Leu Leu  
 1 5 10 15

Ala Phe Val Phe Leu Ser Ile Ile Leu Trp Arg Arg Thr Leu Thr Ser  
 20 25 30

Arg Lys Leu Ala Pro Glu Ile Pro Gly Ala Trp Pro Ile Ile Gly His  
 35 40 45

Leu Arg Gln Leu Ser Gly Thr Asp Lys Asn Ile Pro Phe Pro Arg Ile  
 50 55 60

Leu Gly Ala Leu Ala Asp Lys Tyr Gly Pro Val Phe Thr Leu Arg Ile  
 65 70 75 80

Gly Met Tyr Pro Tyr Leu Ile Val Asn Asn Trp Glu Ala Ala Lys Asp  
 85 90 95

Cys Leu Thr Thr His Asp Lys Asp Phe Ala Ala Arg Pro Thr Ser Met  
 100 105 110

Ala Gly Glu Ser Ile Gly Tyr Lys Tyr Ala Arg Phe Thr Tyr Ala Asn  
 115 120 125

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Phe Gly Pro Tyr Tyr Asn Gln Val Arg Lys Leu Ala Leu Gln His Val  
 130 135 140  
 Leu Ser Ser Thr Lys Leu Glu Lys Met Lys His Ile Arg Val Ser Glu  
 145 150 155 160  
 Leu Glu Thr Ser Ile Lys Glu Leu Tyr Ser Leu Thr Leu Gly Lys Asn  
 165 170 175  
 Asn Met Gln Lys Val Asn Ile Ser Lys Trp Phe Glu Gln Leu Thr Leu  
 180 185 190  
 Asn Ile Ile Val Lys Thr Ile Cys Gly Lys Arg Tyr Ser Asn Ile Glu  
 195 200 205  
 Glu Asp Glu Glu Ala Gln Arg Phe Arg Lys Ala Phe Lys Gly Ile Met  
 210 215 220  
 Phe Val Val Gly Gln Ile Val Leu Tyr Asp Ala Ile Pro Phe Pro Leu  
 225 230 235 240  
 Phe Lys Tyr Phe Asp Phe Gln Gly His Ile Gln Leu Met Asn Lys Ile  
 245 250 255  
 Tyr Lys Asp Leu Asp Ser Ile Leu Gln Gly Trp Leu Asp Asp His Met  
 260 265 270  
 Met Asn Lys Asp Val Asn Asn Lys Asp Gln Asp Ala Ile Asp Ala Met  
 275 280 285  
 Leu Lys Val Thr Gln Leu Asn Glu Phe Lys Ala Tyr Gly Phe Ser Gln  
 290 295 300  
 Ala Thr Val Ile Lys Ser Thr Val Leu Ser Leu Ile Leu Asp Gly Asn  
 305 310 315 320  
 Asp Thr Thr Ala Val His Leu Ile Trp Val Met Ser Leu Leu Leu Asn  
 325 330 335  
 Asn Pro His Val Met Lys Gln Gly Gln Glu Glu Ile Asp Met Lys Val  
 340 345 350  
 Gly Lys Glu Arg Trp Ile Glu Asp Thr Asp Ile Lys Asn Leu Val Tyr  
 355 360 365  
 Leu Gln Ala Ile Val Lys Glu Thr Leu Arg Leu Tyr Pro Pro Val Pro  
 370 375 380

79601-7270 Sequence Listing v2 -03-25-04.ST25

Phe Leu Leu Pro His Glu Ala Val Gln Asp Cys Lys Val Thr Gly Tyr  
385 390 395 400

His Ile Pro Lys Gly Thr Arg Leu Tyr Ile Asn Ala Trp Lys Val His  
405 410 415

Arg Asp Ser Glu Ile Trp Ser Glu Pro Glu Lys Phe Met Pro Asn Arg  
420 425 430

Phe Leu Thr Ser Lys Ala Asn Ile Asp Ala Arg Gly Gln Asn Phe Glu  
435 440 445

Phe Ile Pro Phe Gly Ser Gly Arg Arg Ser Cys Pro Gly Leu Gly Phe  
450 455 460

Ala Thr Leu Val Thr His Leu Thr Phe Gly Arg Leu Leu Gln Gly Phe  
465 470 475 480

Asp Phe Ser Lys Pro Ser Asn Thr Pro Ile Asp Met Thr Glu Gly Val  
485 490 495

Gly Val Thr Leu Pro Lys Val Asn Gln Val Glu Val Leu Ile Thr Pro  
500 505 510

Arg Leu Pro Ser Lys Leu Tyr Leu Phe  
515 520

<210> 271  
<211> 1620  
<212> DNA  
<213> NICOTIANATABACUM

<400> 271  
agagagtga aatggacgca ctacttcaaa tgacagtaac agcatcttgt gctgccatag 60  
taattactct gctggttgtg atatggagag tgctgaactg gatttggttc agaccaaaga 120  
aattggagtt gttgttgaga aaacaagggt tggaaggaaa ttcttacaag gttttgtatg 180  
gggacatgaa agagttttct gggatgatta aggaagcata ctcaaagcct atgagtctat 240  
ctgatgatgt agcaccaaga ctgatgcctt tctttcttga aaccatcaaa aaatatggaa 300  
aaagatcctt tatatggttt ggtccaagac cactagtatt gattatggat cctgagctta 360  
taaaggaagt actctcaaaa atccatctgt atcaaaagcc tgggtggaaat ccattagcaa 420  
cactattggt acaaggaata gcaacctatg aggaagacaa atgggcaaaa catagaaaaa 480  
tcatcaatcc cgctttccat ctagagaagc taaagcttat gcttccagca tttcgcttaa 540  
gctgtagtga gatgctgagc aaatgggaag acattgtttc agctgatagc tcacatgaga 600

## 79601-7270 Sequence Listing v2 -03-25-04.ST25

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tagatgtatg gtctcacctt gagcaattga cttgcatgt gatctctcgg acagcttttg 660
gcagtagtta tgaagaaggt agaaagattt ttgaacttca aaaggaacaa gctcagtatc 720
ttgtggaagt tttccgctcc gtttatatcc caggaaggag atttttgcca acaaagagga 780
atagaagaat gaaggaaata aaaaaggatg tccgggcatc aattaaaggt attattgata 840
aaagattgaa ggcaatgaaa gcaggggaca ccaataatga ggatctattg ggtatattac 900
tggaatcgaa tattaaagaa attgaacagc acggaacaa ggatttttga atgagcattg 960
aagaagtcac tgaagaatgc aagttattct attttgctgg ccaagaaact acatcagtgt 1020
tactcctatg gtctctagtg ttgttgagca ggtatcaaga ttggcaggca cgggccagag 1080
aagaaatctt gcaagtcttt ggcagtcgaa aaccagattt tgacggatta aatcatctaa 1140
aaattgtgac aatgatcttg tacgagtcct taaggctgta tccctcacta ataacactta 1200
cccgccggtg taatgaagac attgtattag gagaactatc tctaccagct ggtgttctag 1260
tctctttgcc attgattttg ttgcatcatg atgaagagat atggggtgaa gatgcaaagg 1320
agttcaaacc agagagattt agagaaggaa tatcaagtgc aacaaagggc caactcacat 1380
attttccatt tagctggggg cctagaatat gtattggaca aaattttgcc atgttagaag 1440
caaagatggc tctgtctatg atcctgcaac gcttctcttt tgaactgtct ccgtcttatg 1500
cacatgcccc tcggtccata ataaccgttc agcctcagta tgggtgctcca cttattttcc 1560
acaaactata attttggtac ttctactaat attttagggg ttattcagac tcaaaaaaaaa 1620

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<210> 272
<211> 513
<212> PRT
<213> NICOTIANATABACUM

```

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<400> 272

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Met Thr Val Thr Ala Ser Cys Ala Ala Ile Val Ile Thr Leu Leu Val
1           5           10          15

```

```

Cys Ile Trp Arg Val Leu Asn Trp Ile Trp Phe Arg Pro Lys Lys Leu
          20          25          30

```

```

Glu Leu Leu Leu Arg Lys Gln Gly Leu Glu Gly Asn Ser Tyr Lys Val
          35          40          45

```

```

Leu Tyr Gly Asp Met Lys Glu Phe Ser Gly Met Ile Lys Glu Ala Tyr
          50          55          60

```

```

Ser Lys Pro Met Ser Leu Ser Asp Asp Val Ala Pro Arg Leu Met Pro
65          70          75          80

```



## 79601-7270 Sequence Listing v2 -03-25-04.ST25

Phe Phe Leu Glu Thr Ile Lys Lys Tyr Gly Lys Arg Ser Phe Ile Trp  
 85 90 95  
 Phe Gly Pro Arg Pro Leu Val Leu Ile Met Asp Pro Glu Leu Ile Lys  
 100 105 110  
 Glu Val Leu Ser Lys Ile His Leu Tyr Gln Lys Pro Gly Gly Asn Pro  
 115 120 125  
 Leu Ala Thr Leu Leu Val Gln Gly Ile Ala Thr Tyr Glu Glu Asp Lys  
 130 135 140  
 Trp Ala Lys His Arg Lys Ile Ile Asn Pro Ala Phe His Leu Glu Lys  
 145 150 155 160  
 Leu Lys Leu Met Leu Pro Ala Phe Arg Leu Ser Cys Ser Glu Met Leu  
 165 170 175  
 Ser Lys Trp Glu Asp Ile Val Ser Ala Asp Ser Ser His Glu Ile Asp  
 180 185 190  
 Val Trp Ser His Leu Glu Gln Leu Thr Cys Asp Val Ile Ser Arg Thr  
 195 200 205  
 Ala Phe Gly Ser Ser Tyr Glu Glu Gly Arg Lys Ile Phe Glu Leu Gln  
 210 215 220  
 Lys Glu Gln Ala Gln Tyr Leu Val Glu Val Phe Arg Ser Val Tyr Ile  
 225 230 235 240  
 Pro Gly Arg Arg Phe Leu Pro Thr Lys Arg Asn Arg Arg Met Lys Glu  
 245 250 255  
 Ile Lys Lys Asp Val Arg Ala Ser Ile Lys Gly Ile Ile Asp Lys Arg  
 260 265 270  
 Leu Lys Ala Met Lys Ala Gly Asp Thr Asn Asn Glu Asp Leu Leu Gly  
 275 280 285  
 Ile Leu Leu Glu Ser Asn Ile Lys Glu Ile Glu Gln His Gly Asn Lys  
 290 295 300  
 Asp Phe Gly Met Ser Ile Glu Glu Val Ile Glu Glu Cys Lys Leu Phe  
 305 310 315 320  
 Tyr Phe Ala Gly Gln Glu Thr Thr Ser Val Leu Leu Leu Trp Ser Leu  
 325 330 335

79601-7270 Sequence Listing v2 -03-25-04.ST25

Val Leu Leu Ser Arg Tyr Gln Asp Trp Gln Ala Arg Ala Arg Glu Glu  
340 345 350

Ile Leu Gln Val Phe Gly Ser Arg Lys Pro Asp Phe Asp Gly Leu Asn  
355 360 365

His Leu Lys Ile Val Thr Met Ile Leu Tyr Glu Ser Leu Arg Leu Tyr  
370 375 380

Pro Ser Leu Ile Thr Leu Thr Arg Arg Cys Asn Glu Asp Ile Val Leu  
385 390 395 400

Gly Glu Leu Ser Leu Pro Ala Gly Val Leu Val Ser Leu Pro Leu Ile  
405 410 415

Leu Leu His His Asp Glu Glu Ile Trp Gly Glu Asp Ala Lys Glu Phe  
420 425 430

Lys Pro Glu Arg Phe Arg Glu Gly Ile Ser Ser Ala Thr Lys Gly Gln  
435 440 445

Leu Thr Tyr Phe Pro Phe Ser Trp Gly Pro Arg Ile Cys Ile Gly Gln  
450 455 460

Asn Phe Ala Met Leu Glu Ala Lys Met Ala Leu Ser Met Ile Leu Gln  
465 470 475 480

Arg Phe Ser Phe Glu Leu Ser Pro Ser Tyr Ala His Ala Pro Arg Ser  
485 490 495

Ile Ile Thr Val Gln Pro Gln Tyr Gly Ala Pro Leu Ile Phe His Lys  
500 505 510

Leu

<210> 273  
<211> 1671  
<212> DNA  
<213> NICOTIANATABACUM

<400> 273  
tgcaatatag ttttcctagt cagttctagc ctccttttcc ttagaaataa tggattatca 60  
tatttccttc cattttcaag ctcttttagg gcttttagcc tttgtgttct tgtctattat 120  
cttatggaga agaacactca cttcaagaaa attagcccct gaaatcccag gggcatggcc 180  
tattataggc catcttcgtc agctgagtgg tactgataag aatatcccat ttccccgaat 240

## 79601-7270 Sequence Listing v2 -03-25-04.ST25

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attgggcgct ttggcagata aatatggacc tgtcttcaca ctgagaatag ggatgtaccc 300
ctatttgatt gtcaacaatt ggggaagcagc taaggattgt ctcacaacgc atgataagga 360
cttggctgcc cgaccaactt ctatggctgg tgaaagcatc ggggtacaagt atgcgagggt 420
tacttatgct aatttttggtc cttattataa ccaagtgcgc aaactagccc tacaacatgt 480
actctcgagt actaaactcg agaaaatgaa acacatacgt gtttctgaat tggaaactag 540
catcaaagaa ttatatctt tgacgctggg caaaaacaac atgcaaaaag tgaatataag 600
taaatggttt gaacaattga ctttaaacad aatcgtgaag acaatttggt gcaagagata 660
tagcaacata gaggaggatg aagaggcaca acgtttcaga aaggcattta agggcatcat 720
gtttgttgta gggcaaattg ttttatatga cgcaattcca ttcccattgt tcaaatactt 780
tgatttccaa ggtcatatac aattgatgaa caaaatttat aaagacttag attctattct 840
tcaaggatgg ttggatgatc atatgatgaa caaggatgta aacaataagg atcaagatgc 900
catagatgcc atgcttaagg taacacaact taatgaattc aaagcctatg gtttttctca 960
ggccactgtg atcaagtcga cagtcttgag tttgatctta gatggaaatg acacaaccgc 1020
tgttcatttg atatgggtaa tgtccttatt actgaacaat ccacatgtta tgaaacaagg 1080
ccaagaagag atagacatga aagtgggtaa agagaggtgg attgaagata ctgacataaa 1140
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gcccgaagg tttatgcca atagattctt gactagcaaa gcaaatatag atgctcgcg 1380
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gccatcaaac acgccaattg acatgacaga aggcgtaggc gttactttgc ctaagggtta 1560
tcaagttgaa gttctaatta cccctcgttt accttctaag ctttatttat tttgaagggt 1620
caaatcatca atcatggctt gagtaattag ttatacttta atatgtttct c 1671

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<210> 274  
 <211> 521  
 <212> PRT  
 <213> NICOTIANATABACUM

<400> 274

Met Asp Tyr His Ile Ser Phe His Phe Gln Ala Leu Leu Gly Leu Leu  
 1 5 10 15

Ala Phe Val Phe Leu Ser Ile Ile Leu Trp Arg Arg Thr Leu Thr Ser  
 20 25 30

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Arg Lys Leu Ala Pro Glu Ile Pro Gly Ala Trp Pro Ile Ile Gly His  
35 40 45

Leu Arg Gln Leu Ser Gly Thr Asp Lys Asn Ile Pro Phe Pro Arg Ile  
50 55 60

Leu Gly Ala Leu Ala Asp Lys Tyr Gly Pro Val Phe Thr Leu Arg Ile  
65 70 75 80

Gly Met Tyr Pro Tyr Leu Ile Val Asn Asn Trp Glu Ala Ala Lys Asp  
85 90 95

Cys Leu Thr Thr His Asp Lys Asp Leu Ala Ala Arg Pro Thr Ser Met  
100 105 110

Ala Gly Glu Ser Ile Gly Tyr Lys Tyr Ala Arg Phe Thr Tyr Ala Asn  
115 120 125

Phe Gly Pro Tyr Tyr Asn Gln Val Arg Lys Leu Ala Leu Gln His Val  
130 135 140

Leu Ser Ser Thr Lys Leu Glu Lys Met Lys His Ile Arg Val Ser Glu  
145 150 155 160

Leu Glu Thr Ser Ile Lys Glu Leu Tyr Ser Leu Thr Leu Gly Lys Asn  
165 170 175

Asn Met Gln Lys Val Asn Ile Ser Lys Trp Phe Glu Gln Leu Thr Leu  
180 185 190

Asn Ile Ile Val Lys Thr Ile Cys Gly Lys Arg Tyr Ser Asn Ile Glu  
195 200 205

Glu Asp Glu Glu Ala Gln Arg Phe Arg Lys Ala Phe Lys Gly Ile Met  
210 215 220

Phe Val Val Gly Gln Ile Val Leu Tyr Asp Ala Ile Pro Phe Pro Leu  
225 230 235 240

Phe Lys Tyr Phe Asp Phe Gln Gly His Ile Gln Leu Met Asn Lys Ile  
245 250 255

Tyr Lys Asp Leu Asp Ser Ile Leu Gln Gly Trp Leu Asp Asp His Met  
260 265 270

Met Asn Lys Asp Val Asn Asn Lys Asp Gln Asp Ala Ile Asp Ala Met  
275 280 285

## 79601-7270 Sequence Listing v2 -03-25-04.ST25

Leu Lys Val Thr Gln Leu Asn Glu Phe Lys Ala Tyr Gly Phe Ser Gln  
 290 295 300

Ala Thr Val Ile Lys Ser Thr Val Leu Ser Leu Ile Leu Asp Gly Asn  
 305 310 315 320

Asp Thr Thr Ala Val His Leu Ile Trp Val Met Ser Leu Leu Leu Asn  
 325 330 335

Asn Pro His Val Met Lys Gln Gly Gln Glu Glu Ile Asp Met Lys Val  
 340 345 350

Gly Lys Glu Arg Trp Ile Glu Asp Thr Asp Ile Lys Asn Leu Val Tyr  
 355 360 365

Leu Gln Ala Ile Val Lys Glu Thr Leu Arg Leu Tyr Pro Pro Val Pro  
 370 375 380

Phe Leu Leu Pro His Glu Ala Val Gln Asp Cys Lys Val Thr Gly Tyr  
 385 390 395 400

His Ile Pro Lys Gly Thr Arg Leu Tyr Ile Asn Ala Trp Lys Val His  
 405 410 415

Arg Asp Pro Glu Ile Trp Ser Glu Pro Glu Lys Phe Met Pro Asn Arg  
 420 425 430

Phe Leu Thr Ser Lys Ala Asn Ile Asp Ala Arg Gly Gln Asn Phe Glu  
 435 440 445

Phe Ile Pro Phe Gly Ser Gly Arg Arg Ser Cys Pro Gly Ile Gly Phe  
 450 455 460

Ala Thr Leu Val Thr His Leu Thr Phe Gly Arg Leu Leu Gln Gly Phe  
 465 470 475 480

Asp Phe Ser Lys Pro Ser Asn Thr Pro Ile Asp Met Thr Glu Gly Val  
 485 490 495

Gly Val Thr Leu Pro Lys Val Asn Gln Val Glu Val Leu Ile Thr Pro  
 500 505 510

Arg Leu Pro Ser Lys Leu Tyr Leu Phe  
 515 520

<210> 275

## 79601-7270 Sequence Listing v2 -03-25-04.ST25

&lt;211&gt; 1618

&lt;212&gt; DNA

&lt;213&gt; NICOTIANATABACUM

&lt;400&gt; 275

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cctccaagtc cattttctct tccaataaatt ggtcaccttt accttctcaa gaaaactctc      180
catctcactc taacatcctt atcagctaaa tatggctctg ttttatacct caaattgggc      240
tctatgcctg tgattgttgt gtcctcacca tctgctgttg aagaatgttt aaccaagaat      300
gatatcatat tcgcaaatag gcccaagacc gtggctggtg acaagtttac ctacaattat      360
actgtttatg tttgggcacc ctatggccaa ctttggagaa ttcttcgccg attaaactgtc      420
gttgaactct tctcttcaca tagcctacag aaaacttcta tccttagaga tcaagaagtt      480
gcaatattta tccgttcggt atacaaattc tcaaaggata gtagcaaaaa agtcgatttg      540
accaactggg cttttacttt ggttttcaat cttatgacca aaattattgc tgggagacat      600
attgtgaagg aggaagatgc tggcaaggaa aagggcattg aaattattga aaaacttaga      660
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gaatcagagc ctgaattcta cactgatgat atcatcaaaa gtattatgct ggtagttttt      960
gttgcaggaa cagagacctc atcaacaacc atccaatggg taatgaggct tctttagact     1020
caccctgagg cattgtataa gctacgagct gacattgaca gtaaagttgg gaataagcgc     1080
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tgccctggag ctgatatggg gttgcgagca gtttcttttg cattaggtgc acttattcaa     1440
tgctttgact ggcaaattga ggaagcggaa agcttggagg aaagctataa ttctagaatg     1500
actatgcaga acaagccttt gaaggttgtc tgcaactcac gcgaagatct tggccagctt     1560
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```

&lt;210&gt; 276

&lt;211&gt; 520

&lt;212&gt; PRT

&lt;213&gt; NICOTIANATABACUM

&lt;400&gt; 276

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 1 5 10 15

Ile Val Leu Phe Leu Leu Pro Ile Leu Val Lys Tyr Phe Phe His Arg  
 20 25 30

Arg Arg Asn Leu Pro Pro Ser Pro Phe Ser Leu Pro Ile Ile Gly His  
 35 40 45

Leu Tyr Leu Leu Lys Lys Thr Leu His Leu Thr Leu Thr Ser Leu Ser  
 50 55 60

Ala Lys Tyr Gly Pro Val Leu Tyr Leu Lys Leu Gly Ser Met Pro Val  
 65 70 75 80

Ile Val Val Ser Ser Pro Ser Ala Val Glu Glu Cys Leu Thr Lys Asn  
 85 90 95

Asp Ile Ile Phe Ala Asn Arg Pro Lys Thr Val Ala Gly Asp Lys Phe  
 100 105 110

Thr Tyr Asn Tyr Thr Val Tyr Val Trp Ala Pro Tyr Gly Gln Leu Trp  
 115 120 125

Arg Ile Leu Arg Arg Leu Thr Val Val Glu Leu Phe Ser Ser His Ser  
 130 135 140

Leu Gln Lys Thr Ser Ile Leu Arg Asp Gln Glu Val Ala Ile Phe Ile  
 145 150 155 160

Arg Ser Leu Tyr Lys Phe Ser Lys Asp Ser Ser Lys Lys Val Asp Leu  
 165 170 175

Thr Asn Trp Ser Phe Thr Leu Val Phe Asn Leu Met Thr Lys Ile Ile  
 180 185 190

Ala Gly Arg His Ile Val Lys Glu Glu Asp Ala Gly Lys Glu Lys Gly  
 195 200 205

Ile Glu Ile Ile Glu Lys Leu Arg Gly Thr Phe Leu Val Thr Thr Ser  
 210 215 220

Phe Leu Asn Met Cys Asp Phe Leu Pro Val Phe Arg Trp Val Gly Tyr  
 225 230 235 240

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Lys Gly Gln Glu Lys<sub>245</sub> Lys Met Ala Ser Ile<sub>250</sub> His Asn Arg Arg Asn<sub>255</sub> Glu  
 Phe Leu Asn Ser<sub>260</sub> Leu Leu Asp Glu Phe<sub>265</sub> Arg His Lys Lys Ser<sub>270</sub> Ser Ala  
 Ser Gln Ser<sub>275</sub> Asn Thr Thr Val Gly<sub>280</sub> Asn Met Glu Lys Lys<sub>285</sub> Thr Thr Leu  
 Ile Glu<sub>290</sub> Lys Leu Leu Ser<sub>295</sub> Leu Gln Glu Ser Glu Pro<sub>300</sub> Glu Phe Tyr Thr  
 Asp<sub>305</sub> Asp Ile Ile Lys Ser<sub>310</sub> Ile Met Leu Val Val<sub>315</sub> Phe Val Ala Gly Thr<sub>320</sub>  
 Glu Thr Ser Ser<sub>325</sub> Thr Thr Ile Gln Trp Val<sub>330</sub> Met Arg Leu Leu Val<sub>335</sub> Ala  
 His Pro Glu Ala<sub>340</sub> Leu Tyr Lys Leu Arg<sub>345</sub> Ala Asp Ile Asp Ser<sub>350</sub> Lys Val  
 Gly Asn Lys<sub>355</sub> Arg Leu Leu Asn Glu<sub>360</sub> Ser Asp Leu Asn Lys<sub>365</sub> Leu Pro Tyr  
 Leu His<sub>370</sub> Cys Val Val Asn Glu<sub>375</sub> Thr Met Arg Leu Tyr<sub>380</sub> Thr Pro Ile Pro  
 Leu<sub>385</sub> Leu Leu Pro His Tyr<sub>390</sub> Ser Thr Lys Asp Cys<sub>395</sub> Ile Val Glu Gly Tyr<sub>400</sub>  
 Asp Val Pro Lys His<sub>405</sub> Thr Met Leu Phe Val<sub>410</sub> Asn Ala Trp Ala Ile<sub>415</sub> His  
 Arg Asp Pro Lys<sub>420</sub> Val Trp Glu Glu Pro<sub>425</sub> Asp Lys Phe Lys Pro<sub>430</sub> Glu Arg  
 Phe Glu Ala<sub>435</sub> Thr Glu Gly Glu Thr<sub>440</sub> Glu Arg Phe Asn Tyr<sub>445</sub> Lys Leu Val  
 Pro Phe<sub>450</sub> Gly Met Gly Arg Arg<sub>455</sub> Ala Cys Pro Gly Ala<sub>460</sub> Asp Met Gly Leu  
 Arg Ala Val Ser Leu Ala<sub>470</sub> Leu Gly Ala Leu Ile<sub>475</sub> Gln Cys Phe Asp Trp<sub>480</sub>  
 Gln Ile Glu Glu Ala<sub>485</sub> Glu Ser Leu Glu Glu<sub>490</sub> Ser Tyr Asn Ser Arg<sub>495</sub> Met



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Thr Met Gln Asn Lys Pro Leu Lys Val Val Cys Thr Pro Arg Glu Asp  
500 505 510

Leu Gly Gln Leu Leu Ser Gln Leu  
515 520

<210> 277  
<211> 1676  
<212> DNA  
<213> NICOTIANATABACUM

<400> 277  
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tattgcaatt atcttggtat atacatggaa agtggtgaat tgggcttggt ttgggccgaa 180  
gaaaatggag aaatgcttaa gacagagggg tctcaaggga aatccttata agctactcta 240  
tgagatcta aacgaactga caaaaagcat aatagaagcc aagtctaagc ccatcaattt 300  
ctctgatgat attgctcaaa ggctcatccc ttttttctt gacgccatca acaaaaatgg 360  
taaaaactcc ttcgtctggc ttggaccgta tccaatagtg ttgatcacgg atcctgagca 420  
tttaaaggag attttcacaa agaattatgt gtatcaaaaag caaactcatc ccaatccata 480  
cgccaagcta ttagctcacg gtcttgtcag ccttgaggaa gacaaatggg ccaaacacag 540  
aaaaatcatt agtcctgcct tccatgtcga gaagctaaag catatgctgc ctgcatttta 600  
tctgagttgt agtgaaatga taagcaaag ggaggagggt gttccaaaag aaacatcatt 660  
cgagctcgat gtatggccag accttcaaat aatgaccagt gaagtcattt ctgcactgc 720  
atttgggagt agctatgaag aaggaagaat agtatttgaa cttcagaaag aacaagctga 780  
gtatgtaatg gacataggac gttcaattta tataccagga tcaaggttct tgcctactaa 840  
aaggaacaaa agaattgctgg aaattgaaaa gcaagtgcga acaacaatta ggcgtatcat 900  
cgacaaaaga ttgaaggcaa tggaagaagg ggagactagt aaagatgact tattaggcat 960  
attacttgaa tccaatttga aagaaattga acttcatgga agaaatgact tgggaataac 1020  
aacgtcagaa gtgattgaag agtgcaagtt attctatttt gccggccaag agaccacttc 1080  
agtgttgctt gtttggacaa tgattttggt gtgcttacat ccagagtggc aagtacgtgc 1140  
cagaaaggaa gtgttgacga tctttggaat tgataaacca gatttggaag gactaagtcg 1200  
cttgaaaatt gtaacaatga tcttgtacga gacgttacgc ctattcccc cattaccagc 1260  
atttggtaga aggaacaaa aagaagtcaa attaggggag ctacatctac cggctggagt 1320  
gttactcgtt ataccagcaa tcttagtaca ttatgataag gaaatatggg gtgaagatgc 1380  
aaaggaattc aaaccagaaa gattcagtga aggagtgtca aaggcaacaa atggacaagt 1440

79601-7270 Sequence Listing v2 -03-25-04.ST25

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 ttatacacat gctccatttg caattgtgac tattcatccc cagtatgggtg ctcctctgct 1620  
 tatgcgcaga ctttaaaaca tatgttgctg atatttaaga tcagtggcgt tttatt 1676

<210> 278  
 <211> 516  
 <212> PRT  
 <213> NICOTIANATABACUM

<400> 278

Met Glu Met Met Tyr Ser Ile Ile Ala Ala Ala Ser Ile Ala Ile Ile  
 1 5 10 15

Leu Val Tyr Thr Trp Lys Val Leu Asn Trp Ala Trp Phe Gly Pro Lys  
 20 25 30

Lys Met Glu Lys Cys Leu Arg Gln Arg Gly Leu Lys Gly Asn Pro Tyr  
 35 40 45

Lys Leu Leu Tyr Gly Asp Leu Asn Glu Leu Thr Lys Ser Ile Ile Glu  
 50 55 60

Ala Lys Ser Lys Pro Ile Asn Phe Ser Asp Asp Ile Ala Gln Arg Leu  
 65 70 75 80

Ile Pro Phe Phe Leu Asp Ala Ile Asn Lys Asn Gly Lys Asn Ser Phe  
 85 90 95

Val Trp Leu Gly Pro Tyr Pro Ile Val Leu Ile Thr Asp Pro Glu His  
 100 105 110

Leu Lys Glu Ile Phe Thr Lys Asn Tyr Val Tyr Gln Lys Gln Thr His  
 115 120 125

Pro Asn Pro Tyr Ala Lys Leu Leu Ala His Gly Leu Val Ser Leu Glu  
 130 135 140

Glu Asp Lys Trp Ala Lys His Arg Lys Ile Ile Ser Pro Ala Phe His  
 145 150 155 160

Val Glu Lys Leu Lys His Met Leu Pro Ala Phe Tyr Leu Ser Cys Ser  
 165 170 175

Glu Met Ile Ser Lys Trp Glu Glu Val Val Pro Lys Glu Thr Ser Phe  
 180 185 190

79601-7270 Sequence Listing v2 -03-25-04.ST25

Glu Leu Asp Val Trp Pro Asp Leu Gln Ile Met Thr Ser Glu Val Ile  
195 200 205

Ser Arg Thr Ala Phe Gly Ser Ser Tyr Glu Glu Gly Arg Ile Val Phe  
210 215 220

Glu Leu Gln Lys Glu Gln Ala Glu Tyr Val Met Asp Ile Gly Arg Ser  
225 230 235 240

Ile Tyr Ile Pro Gly Ser Arg Phe Leu Pro Thr Lys Arg Asn Lys Arg  
245 250 255

Met Leu Glu Ile Glu Lys Gln Val Gln Thr Thr Ile Arg Arg Ile Ile  
260 265 270

Asp Lys Arg Leu Lys Ala Met Glu Glu Gly Glu Thr Ser Lys Asp Asp  
275 280 285

Leu Leu Gly Ile Leu Leu Glu Ser Asn Leu Lys Glu Ile Glu Leu His  
290 295 300

Gly Arg Asn Asp Leu Gly Ile Thr Thr Ser Glu Val Ile Glu Glu Cys  
305 310 315 320

Lys Leu Phe Tyr Phe Ala Gly Gln Glu Thr Thr Ser Val Leu Leu Val  
325 330 335

Trp Thr Met Ile Leu Leu Cys Leu His Pro Glu Trp Gln Val Arg Ala  
340 345 350

Arg Lys Glu Val Leu Gln Ile Phe Gly Asn Asp Lys Pro Asp Leu Glu  
355 360 365

Gly Leu Ser Arg Leu Lys Ile Val Thr Met Ile Leu Tyr Glu Thr Leu  
370 375 380

Arg Leu Phe Pro Pro Leu Pro Ala Phe Gly Arg Arg Asn Lys Glu Glu  
385 390 395 400

Val Lys Leu Gly Glu Leu His Leu Pro Ala Gly Val Leu Leu Val Ile  
405 410 415

Pro Ala Ile Leu Val His Tyr Asp Lys Glu Ile Trp Gly Glu Asp Ala  
420 425 430

Lys Glu Phe Lys Pro Glu Arg Phe Ser Glu Gly Val Ser Lys Ala Thr  
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435

440

445

Asn Gly Gln Val Ser Phe Ile Pro Phe Ser Trp Gly Pro Arg Val Cys  
 450 455 460

Ile Gly Gln Asn Phe Ala Met Met Glu Ala Lys Met Ala Val Thr Met  
 465 470 475 480

Ile Leu Gln Lys Phe Ser Phe Glu Leu Ser Pro Ser Tyr Thr His Ala  
 485 490 495

Pro Phe Ala Ile Val Thr Ile His Pro Gln Tyr Gly Ala Pro Leu Leu  
 500 505 510

Met Arg Arg Leu  
 515

&lt;210&gt; 279

&lt;211&gt; 1577

&lt;212&gt; DNA

&lt;213&gt; NICOTIANATABACUM

&lt;400&gt; 279

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aaaaaacaat caaaaatctt aaacccta cctccaaaaa tcccagggtg atggccagta	180
atcggccatc tcttttattt caagaacaat ggcgatgaag atcgccattt ttctcaaaaa	240
ctcggtgact tagctgacaa atatggtccc gtcttcactt tccggttagg gtttcgccgt	300
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ctctccgtta gtcggctcga aaaattcaaa catgttagat tttctataat tcagaaaaat	540
attaaacaat tgtataattg tgattcacca atggtgaaga taaaccttag tgattggata	600
gataaattga cattcgacat cattttgaaa atggttggtg ggaagaacta taataatgga	660
catggagaaa tactcaaagt tgcttttcag aaattcatgg ttcaagctat ggagatggag	720
ctctatgatg tttttcacat tccatttttc aagtggttgg atcttacagg gaatattaag	780
gctatgaaac aaactttcaa agacattgat aatattatcc aaggttggtt agatgagcac	840
attaagaaga gagaaacaaa ggatgttgga ggtgaaaacg aacaagattt tatagatgtg	900
gtgctttcca agatgagcga cgaacatctt ggcgaggggtt actctcatga cacaaccatc	960
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## 79601-7270 Sequence Listing v2 -03-25-04.ST25

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gacacaattg ttggtagaga tagatgggta gaagagagtг atatcaagaa tttggtgtat 1140
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ctaattaccc ctcgttt 1577

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<210> 280
<211> 511
<212> PRT
<213> NICOTIANATABACUM

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<400> 280

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Met Val Tyr Leu Leu Ser Pro Ile Glu Ala Ile Val Gly Phe Val Thr
1           5           10           15

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```

Phe Ser Phe Leu Phe Tyr Phe Leu Trp Thr Lys Lys Gln Ser Lys Ile
20           25           30

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```

Leu Asn Pro Leu Pro Pro Lys Ile Pro Gly Gly Trp Pro Val Ile Gly
35           40           45

```

```

His Leu Phe Tyr Phe Lys Asn Asn Gly Asp Glu Asp Arg His Phe Ser
50           55           60

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```

Gln Lys Leu Gly Asp Leu Ala Asp Lys Tyr Gly Pro Val Phe Thr Phe
65           70           75           80

```

```

Arg Leu Gly Phe Arg Arg Phe Leu Ala Val Ser Ser Tyr Glu Ala Met
85           90           95

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```

Lys Glu Cys Phe Thr Thr Asn Asp Ile His Phe Ala Asp Arg Pro Ser
100          105          110

```

```

Leu Leu Tyr Gly Glu Tyr Leu Cys Tyr Asn Asn Ala Met Leu Ala Val
115          120          125

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Ala Lys Tyr Gly Pro Tyr Trp Lys Lys Asn Arg Lys Leu Val Asn Gln
130          135          140

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79601-7270 Sequence Listing v2 -03-25-04.ST25

Glu	Val	Leu	Ser	Val	Ser	Arg	Leu	Glu	Lys	Phe	Lys	His	Val	Arg	Phe
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Ser	Ile	Ile	Gln	Lys	Asn	Ile	Lys	Gln	Leu	Tyr	Asn	Cys	Asp	Ser	Pro
				165					170					175	
Met	Val	Lys	Ile	Asn	Leu	Ser	Asp	Trp	Ile	Asp	Lys	Leu	Thr	Phe	Asp
			180					185					190		
Ile	Ile	Leu	Lys	Met	Val	Val	Gly	Lys	Asn	Tyr	Asn	Asn	Gly	His	Gly
		195					200					205			
Glu	Ile	Leu	Lys	Val	Ala	Phe	Gln	Lys	Phe	Met	Val	Gln	Ala	Met	Glu
	210					215					220				
Met	Glu	Leu	Tyr	Asp	Val	Phe	His	Ile	Pro	Phe	Phe	Lys	Trp	Leu	Asp
225					230					235					240
Leu	Thr	Gly	Asn	Ile	Lys	Ala	Met	Lys	Gln	Thr	Phe	Lys	Asp	Ile	Asp
				245					250					255	
Asn	Ile	Ile	Gln	Gly	Trp	Leu	Asp	Glu	His	Ile	Lys	Lys	Arg	Glu	Thr
			260					265					270		
Lys	Asp	Val	Gly	Gly	Glu	Asn	Glu	Gln	Asp	Phe	Ile	Asp	Val	Val	Leu
		275					280					285			
Ser	Lys	Met	Ser	Asp	Glu	His	Leu	Gly	Glu	Gly	Tyr	Ser	His	Asp	Thr
	290					295					300				
Thr	Ile	Lys	Ala	Thr	Val	Phe	Thr	Leu	Val	Leu	Asp	Ala	Thr	Asp	Thr
305					310					315					320
Leu	Ala	Leu	His	Ile	Lys	Trp	Val	Met	Ala	Leu	Met	Ile	Asn	Asn	Lys
				325					330					335	
His	Val	Met	Lys	Lys	Ala	Gln	Glu	Glu	Met	Asp	Thr	Ile	Val	Gly	Arg
			340					345					350		
Asp	Arg	Trp	Val	Glu	Glu	Ser	Asp	Ile	Lys	Asn	Leu	Val	Tyr	Leu	Gln
		355					360					365			
Ala	Ile	Val	Lys	Glu	Val	Leu	Arg	Leu	His	Pro	Pro	Ala	Pro	Leu	Ser
	370					375					380				
Val	Gln	His	Leu	Ser	Val	Glu	Asp	Cys	Val	Val	Asn	Gly	Tyr	His	Ile
385					390					395					400

79601-7270 Sequence Listing v2 -03-25-04.ST25

Pro Lys Gly Thr Ala Leu Leu Thr Asn Ile Met Lys Leu Gln Arg Asp  
405 410 415

Pro Gln Thr Trp Pro Asn Pro Asp Lys Phe Asp Pro Glu Arg Phe Leu  
420 425 430

Thr Thr His Ala Thr Ile Asp Tyr Arg Gly Gln His Tyr Glu Leu Ile  
435 440 445

Pro Phe Gly Thr Gly Arg Arg Ala Cys Pro Ala Met Asn Tyr Ser Leu  
450 455 460

Gln Val Glu His Leu Ser Ile Ala His Met Ile Gln Gly Phe Ser Phe  
465 470 475 480

Ala Thr Thr Thr Asn Glu Pro Leu Asp Met Lys Gln Gly Val Gly Leu  
485 490 495

Thr Leu Pro Lys Lys Thr Asp Val Glu Val Leu Ile Thr Pro Arg  
500 505 510

<210> 281  
<211> 1434  
<212> DNA  
<213> NICOTIANATABACUM

<220>  
<221> misc\_feature  
<222> (564)..(564)  
<223> n is a, c, g, or t

<400> 281  
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tcgttcaaag cgttttaagc ttccccagg accaatccca gtaccagttt ttggttaattg 180  
gcttcaagtt ggtgatgatt taaaccacag aaatcttact gattttgccca aaaaatttgg 240  
tgatcttttc ttgttaagaa tgggccagcg taatttagtt gttgtgtcat ctctgaatt 300  
agctaaagaa gttttacaca cacaagggtgt tgaatttggt tcaagaacaa gaaatgttgt 360  
atgtgatatt ttactggaa aagggtcaaga tatgggtttt actgtatatg gtgaacactg 420  
gagaaaaatg aggagaatta tgactgtacc attttttact aataaagttg tgcagcaata 480  
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atctgctact aatgggattg tatnaaggag gagattacaa ttgatgatgt ataataatat 600  
gtttaggatt atgtttgata ggagatttga gagtgaagat gatcctttgt ttgttaagct 660

## 79601-7270 Sequence Listing v2 -03-25-04.ST25

```

taaggctttg aatggtgaaa ggagtagatt ggctcagagt tttgagtata attatggtga 720
ttttattccc attttgaggc cttttttgag aggttatttg aagatctgta aagaagttaa 780
ggagaagagg ctgcagcttt tcaaagatta ctttgttgat gaaagaaaga agctttcaaa 840
taccaagagc ttggacagca atgctctgaa atgtgcgatt gatcacattc ttgaggctca 900
acagaagggg gagatcaatg aggacaacgt tctttacatt gttgaaaaca tcaatgttgc 960
tgctatagaa accacattat ggtcaattga gtgggggtatc gccgagttag tcaaccaccc 1020
tcacatccaa aagaaactcc gcgacgagat tgacacagtt cttggcccag gagtgcgaagt 1080
gactgaacca gacaccaca agcttcata ccttcaggct gtgatcaagg agacgcttcg 1140
tctccgtatg gcaattcctc tattagtccc acacatgaac cttcacgatg caaagcttgg 1200
cgggtttgat attccagcag agagcaaaat cttggttaac gcttgggtggc tagctaacaa 1260
cccggctcat tggaagaaac ccgaagagtt cagacccgag aggttcttcg aagaggagaa 1320
gcacgttgag gccaatggca atgacttcag atatcttccg tttggcgttg gtaggaggag 1380
ttgccctgga actatacttg cattgccaat tcttggcatt actttgggac gttt 1434

```

```

<210> 282
<211> 463
<212> PRT
<213> NICOTIANATABACUM

```

```

<400> 282

```

```

Met Asp Leu Leu Leu Leu Glu Lys Thr Leu Ile Gly Leu Phe Phe Ala
1           5           10          15

```

```

Ile Leu Ile Ala Val Ile Val Ser Arg Leu Arg Ser Lys Arg Phe Lys
          20          25          30

```

```

Leu Pro Pro Gly Pro Ile Pro Val Pro Val Phe Gly Asn Trp Leu Gln
          35          40          45

```

```

Val Gly Asp Asp Leu Asn His Arg Asn Leu Thr Asp Phe Ala Lys Lys
50          55          60

```

```

Phe Gly Asp Leu Phe Leu Leu Arg Met Gly Gln Arg Asn Leu Val Val
65          70          75          80

```

```

Val Ser Ser Pro Glu Leu Ala Lys Glu Val Leu His Thr Gln Gly Val
          85          90          95

```

```

Glu Phe Gly Ser Arg Thr Arg Asn Val Val Phe Asp Ile Phe Thr Gly
          100          105          110

```



## 79601-7270 Sequence Listing v2 -03-25-04.ST25

Lys Gly Gln Asp Met Val Phe Thr Val Tyr Gly Glu His Trp Arg Lys  
 115 120 125  
 Met Arg Arg Ile Met Thr Val Pro Phe Phe Thr Asn Lys Val Val Gln  
 130 135 140  
 Gln Tyr Arg Gly Gly Trp Glu Phe Glu Val Ala Ser Val Ile Glu Asp  
 145 150 155 160  
 Val Lys Lys Asn Pro Glu Ser Ala Thr Asn Gly Ile Val Leu Arg Arg  
 165 170 175  
 Arg Leu Gln Leu Met Met Tyr Asn Asn Met Phe Arg Ile Met Phe Asp  
 180 185 190  
 Arg Arg Phe Glu Ser Glu Asp Asp Pro Leu Phe Val Lys Leu Lys Ala  
 195 200 205  
 Leu Asn Gly Glu Arg Ser Arg Leu Ala Gln Ser Phe Glu Tyr Asn Tyr  
 210 215 220  
 Gly Asp Phe Ile Pro Ile Leu Arg Pro Phe Leu Arg Gly Tyr Leu Lys  
 225 230 235 240  
 Ile Cys Lys Glu Val Lys Glu Lys Arg Leu Gln Leu Phe Lys Asp Tyr  
 245 250 255  
 Phe Val Asp Glu Arg Lys Lys Leu Ser Asn Thr Lys Ser Leu Asp Ser  
 260 265 270  
 Asn Ala Leu Lys Cys Ala Ile Asp His Ile Leu Glu Ala Gln Gln Lys  
 275 280 285  
 Gly Glu Ile Asn Glu Asp Asn Val Leu Tyr Ile Val Glu Asn Ile Asn  
 290 295 300  
 Val Ala Ala Ile Glu Thr Thr Leu Trp Ser Ile Glu Trp Gly Ile Ala  
 305 310 315 320  
 Glu Leu Val Asn His Pro His Ile Gln Lys Lys Leu Arg Asp Glu Ile  
 325 330 335  
 Asp Thr Val Leu Gly Pro Gly Val Gln Val Thr Glu Pro Asp Thr His  
 340 345 350  
 Lys Leu Pro Tyr Leu Gln Ala Val Ile Lys Glu Thr Leu Arg Leu Arg  
 355 360 365

## 79601-7270 Sequence Listing v2 -03-25-04.ST25

Met Ala Ile Pro Leu Leu Val Pro His Met Asn Leu His Asp Ala Lys  
 370 375 380

Leu Gly Gly Phe Asp Ile Pro Ala Glu Ser Lys Ile Leu Val Asn Ala  
 385 390 395 400

Trp Trp Leu Ala Asn Asn Pro Ala His Trp Lys Lys Pro Glu Glu Phe  
 405 410 415

Arg Pro Glu Arg Phe Phe Glu Glu Glu Lys His Val Glu Ala Asn Gly  
 420 425 430

Asn Asp Phe Arg Tyr Leu Pro Phe Gly Val Gly Arg Arg Ser Cys Pro  
 435 440 445

Gly Thr Ile Leu Ala Leu Pro Ile Leu Gly Ile Thr Leu Gly Arg  
 450 455 460

<210> 283  
 <211> 1723  
 <212> DNA  
 <213> NICOTIANATABACUM

<400> 283  
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 tgagaatgga gatgatgtac agcataatag cagcagccag tattgcaatt atcttggtat 180  
 atacatggaa agtggtgaat tgggcttggg ttgggcaaaa gaaaatggag aaatgcttaa 240  
 gacagagggg tctcaaggga aatccttata agctactcta tggagatcta aacgaactga 300  
 caaaaagcat aatagaagcc aagtctaagc ccatcaattt ctctgatgat attgctcaaa 360  
 ggctcatccc tttttttctt gacgccatca acaaaaatgg taaaaactcc ttcgtctggc 420  
 ttggaccgta tccaatagtg ttgatcacgg atcctgagca tttaaaggag attttcacia 480  
 agaattatgt gtatcaaaaag caaactcatc ccaatccata cgccaagcta ttagctcacg 540  
 gtcttgtcag ccttgaggaa gacaaatggg ccaaacacag aaaaatcatt agtcctgcct 600  
 tccatgtcga gaagctaaag catatgctgc ctgcatttta tctgagttgt agtgaaatga 660  
 taagcaaatg ggaggagggtt gttccaaaag aaacatcatt cgagctcgat gtatggccag 720  
 accttcaaat aatgaccagt gaagtcattt ctcgcactgc atttgggagt agctatgaag 780  
 aaggaagaat agtatttgaa cttcagaaag aacaagctga gtatgtaatg gacataggac 840  
 gttcaattta tataccagga tcaaggttct tgcctactaa aaggaacaaa agaatgctgg 900  
 aaattgaaaa gcaagtgcga acaacaatta ggcgtatcat cgacaaaaga ttgaaggcaa 960

## 79601-7270 Sequence Listing v2 -03-25-04.ST25

```

tggaagaagg ggagactagt aaagatgact tattaggcat attacttgaa tccaatttga 1020
aagaaattga acttcatgga agaaatgact tgggaataac aacatcagaa gtgattgaag 1080
agtgcaagtt aatctatttt gccggccaag agaccacttc agtggttgctt gtttggacaa 1140
tgattttgtt gtgcttacat ccagagtggc aagtacgtgc cagaaaggaa gtgttgcaga 1200
cctttggaaa tgataaacca gatttgaag gactaagtcg cttgaaaatt gtaacaatga 1260
tcttgtacga gacgttacgc ctattcccc cattaccagc atttggtaga aggaacaaaag 1320
aagaagtcaa attaggggag ctacatctac cggctggagt gttactcgtt ataccagcaa 1380
tcttagtaca ttatgataag gaaatatggg gtgaagatgc aaaggaattc aaaccagaaa 1440
gattcagtga aggagtgtca aaggcaacaa atggacaagt ctcatattata ccatttagct 1500
agggacctcg tgtttgcatt ggacaaaact tcgcaatgat ggaagcaaaa atggcagtaa 1560
ctatgatact acaaaaattc tcctttgaac tatccccttc ttatacacat gctccatttg 1620
caattgtgac tattcatccc cagtatggtg ctctctgct tatgcgcgaga ctttaaaaca 1680
tatgttgctg atatttaaga tcagtggcgt tttattctcc atg 1723

```

<210> 284  
 <211> 458  
 <212> PRT  
 <213> NICOTIANATABACUM

<400> 284

Met Glu Met Met Tyr Ser Ile Ile Ala Ala Ala Ser Ile Ala Ile Ile  
 1 5 10 15

Leu Val Tyr Thr Trp Lys Val Leu Asn Trp Ala Trp Phe Gly Pro Lys  
 20 25 30

Lys Met Glu Lys Cys Leu Arg Gln Arg Gly Leu Lys Gly Asn Pro Tyr  
 35 40 45

Lys Leu Leu Tyr Gly Asp Leu Asn Glu Leu Thr Lys Ser Ile Ile Glu  
 50 55 60

Ala Lys Ser Lys Pro Ile Asn Phe Ser Asp Asp Ile Ala Gln Arg Leu  
 65 70 75 80

Ile Pro Phe Phe Leu Asp Ala Ile Asn Lys Asn Gly Lys Asn Ser Phe  
 85 90 95

Val Trp Leu Gly Pro Tyr Pro Ile Val Leu Ile Thr Asp Pro Glu His  
 100 105 110

Leu Lys Glu Ile Phe Thr Lys Asn Tyr Val Tyr Gln Lys Gln Thr His  
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115

120

125

Pro Asn Pro Tyr Ala Lys Leu Leu Ala His Gly Leu Val Ser Leu Glu  
 130 135 140

Glu Asp Lys Trp Ala Lys His Arg Lys Ile Ile Ser Pro Ala Phe His  
 145 150 155 160

Val Glu Lys Leu Lys His Met Leu Pro Ala Phe Tyr Leu Ser Cys Ser  
 165 170 175

Glu Met Ile Ser Lys Trp Glu Glu Val Val Pro Lys Glu Thr Ser Phe  
 180 185 190

Glu Leu Asp Val Trp Pro Asp Leu Gln Ile Met Thr Ser Glu Val Ile  
 195 200 205

Ser Arg Thr Ala Phe Gly Ser Ser Tyr Glu Glu Gly Arg Ile Val Phe  
 210 215 220

Glu Leu Gln Lys Glu Gln Ala Glu Tyr Val Met Asp Ile Gly Arg Ser  
 225 230 235 240

Ile Tyr Ile Pro Gly Ser Arg Phe Leu Pro Thr Lys Arg Asn Lys Arg  
 245 250 255

Met Leu Glu Ile Glu Lys Gln Val Gln Thr Thr Ile Arg Arg Ile Ile  
 260 265 270

Asp Lys Arg Leu Lys Ala Met Glu Glu Gly Glu Thr Ser Lys Asp Asp  
 275 280 285

Leu Leu Gly Ile Leu Leu Glu Ser Asn Leu Lys Glu Ile Glu Leu His  
 290 295 300

Gly Arg Asn Asp Leu Gly Ile Thr Thr Ser Glu Val Ile Glu Glu Cys  
 305 310 315 320

Lys Leu Ile Tyr Phe Ala Gly Gln Glu Thr Thr Ser Val Leu Leu Val  
 325 330 335

Trp Thr Met Ile Leu Leu Cys Leu His Pro Glu Trp Gln Val Arg Ala  
 340 345 350

Arg Lys Glu Val Leu Gln Thr Phe Gly Asn Asp Lys Pro Asp Leu Glu  
 355 360 365

## 79601-7270 Sequence Listing v2 -03-25-04.ST25

Gly Leu Ser Arg Leu Lys Ile Val Thr Met Ile Leu Tyr Glu Thr Leu  
 370 375 380

Arg Leu Phe Pro Pro Leu Pro Ala Phe Gly Arg Arg Asn Lys Glu Glu  
 385 390 395 400

Val Lys Leu Gly Glu Leu His Leu Pro Ala Gly Val Leu Leu Val Ile  
 405 410 415

Pro Ala Ile Leu Val His Tyr Asp Lys Glu Ile Trp Gly Glu Asp Ala  
 420 425 430

Lys Glu Phe Lys Pro Glu Arg Phe Ser Glu Gly Val Ser Lys Ala Thr  
 435 440 445

Asn Gly Gln Val Ser Phe Ile Pro Phe Ser  
 450 455

<210> 285  
 <211> 1717  
 <212> DNA  
 <213> NICOTIANATABACUM

<400> 285  
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 gatatgatat ggaggacgt aggaagaat tactgggaca aacctagtga gtgaaaatgg 120  
 aaacagttga aatgatagta aaagtatctt gtgctgccat agtaattact ctgttggtgt 180  
 gtctatggag agtgctgaat tgggtttggt tcagaccaa gaaattagag aagttgttga 240  
 gaaaacaggt tttgtatggg gacatgaaag agttttctgg gatgattaag gaagcatact 300  
 caaagcctat gagtctgtct gatgatgtag caccacgaat gatgcctttc tttcttgaaa 360  
 ccatcaagaa atatggaaaa agatccttta tatggttcgg tccaagacca ctagtattga 420  
 tcatggatcc tgagcttata aaggaagtac tctccaaaat ctatctttat caaaagccccg 480  
 gtggaaatcc attagcaaca ctattggtac aaggattagc aacctatgag gaagacaaat 540  
 gggccaaaca tagaaaaatc atcaatcccg ctttccatct agagaagcta aagcatatgc 600  
 ttccagcttt tgccttgagc tgtagtgaga tgctgagcaa atgggaagac attgtttcag 660  
 ctgaaggctc acatgagata gatgtatggc ctaaccttga gcaattgagt tgcgatgtga 720  
 tctctcggac agcttttggc aatagttatg aagaaggtag aaagattttt gaacttcaaa 780  
 aggaacaaac tcagcatctt gtggaagctt tccgctctgt ttatatccca ggaaggagat 840  
 ttttgccaac aaagaggaat agaagaatga aggaaataaa aaaggagggt cgagcgtcaa 900  
 ttaaaggat tattgataaa agattgaagg caatgaaagc aggggacacc aataatgagg 960  
 atctattggg atattgctgg aatcaaattt taaagaaatt gaacagcgcg gaaacaagga 1020

## 79601-7270 Sequence Listing v2 -03-25-04.ST25

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ttttggaatg agcattgaag atgtcattga agaatgcaag ttattctatt ttgctggcca 1080
agaaactaca tcagtgttgc tcctatggtc tctagtgtcg ttgagcaggt atcaagattg 1140
gcagacacgg gccagagaag aagtcttgca tgtctttggg agtcggaaac cagattttga 1200
tgaattaaat catctaaaag ttgtgacaat gatcatgtac gagtctttaa ggctatatcc 1260
ctcactaata acacttaccg gccgggtgtaa tgaagacatt gtattaggag aactatctct 1320
accagctggt gtcctagtct ctttgccaat gattttgttg catcatgatg aagagatatg 1380
gggtgaagat gcaaaggagt tcaaaccaga gagatttaga gaaggattgt caagtgcaac 1440
aaaggggtcaa cttacatatt ttccatttgg ctgggggtcct agaatatgta ttggacaaaa 1500
ttttgccatg ttagaagcaa agatggctct gtctatgatc ctgcaacgct tctcttttga 1560
actgtctccg tcttatgcac atgcccctca gtccatatta accgttcagc ctcaatatgg 1620
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tgtagtaga gtttattcag acttagatac atgcttc 1717

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<210> 286  
 <211> 304  
 <212> PRT  
 <213> NICOTIANATABACUM

<400> 286

Met Glu Thr Val Glu Met Ile Val Lys Val Ser Cys Ala Ala Ile Val  
 1 5 10 15

Ile Thr Leu Leu Val Cys Leu Trp Arg Val Leu Asn Trp Val Trp Phe  
 20 25 30

Arg Pro Lys Lys Leu Glu Lys Leu Leu Arg Lys Gln Val Leu Tyr Gly  
 35 40 45

Asp Met Lys Glu Phe Ser Gly Met Ile Lys Glu Ala Tyr Ser Lys Pro  
 50 55 60

Met Ser Leu Ser Asp Asp Val Ala Pro Arg Met Met Pro Phe Phe Leu  
 65 70 75 80

Glu Thr Ile Lys Lys Tyr Gly Lys Arg Ser Phe Ile Trp Phe Gly Pro  
 85 90 95

Arg Pro Leu Val Leu Ile Met Asp Pro Glu Leu Ile Lys Glu Val Leu  
 100 105 110

Ser Lys Ile Tyr Leu Tyr Gln Lys Pro Gly Gly Asn Pro Leu Ala Thr  
 115 120 125

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Leu Leu Val Gln Gly Leu Ala Thr Tyr Glu Glu Asp Lys Trp Ala Lys  
130 135 140

His Arg Lys Ile Ile Asn Pro Ala Phe His Leu Glu Lys Leu Lys His  
145 150 155 160

Met Leu Pro Ala Phe Arg Leu Ser Cys Ser Glu Met Leu Ser Lys Trp  
165 170 175

Glu Asp Ile Val Ser Ala Glu Gly Ser His Glu Ile Asp Val Trp Pro  
180 185 190

Asn Leu Glu Gln Leu Ser Cys Asp Val Ile Ser Arg Thr Ala Phe Gly  
195 200 205

Asn Ser Tyr Glu Glu Gly Arg Lys Ile Phe Glu Leu Gln Lys Glu Gln  
210 215 220

Thr Gln His Leu Val Glu Ala Phe Arg Ser Val Tyr Ile Pro Gly Arg  
225 230 235 240

Arg Phe Leu Pro Thr Lys Arg Asn Arg Arg Met Lys Glu Ile Lys Lys  
245 250 255

Glu Val Arg Ala Ser Ile Lys Gly Ile Ile Asp Lys Arg Leu Lys Ala  
260 265 270

Met Lys Ala Gly Asp Thr Asn Asn Glu Asp Leu Leu Gly Tyr Cys Trp  
275 280 285

Asn Gln Ile Leu Lys Lys Leu Asn Ser Ala Glu Thr Arg Ile Leu Glu  
290 295 300

<210> 287  
<211> 1559  
<212> DNA  
<213> NICOTIANATABACUM

<400> 287  
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tacctgtact tggaagcatg tttcatttgc taggtggacc tccacatcat gtccttggag 180  
atthagccaa aaaatatggt ccacttatgc accttcaact aggtgaagtt tctgtagttt 240  
ctgttacttc tcctgagatg gcaaaagaag tactaaaaac tcatgacctc gcttttgcac 300  
ctaggccggt acttttggca gccaaaattg tctgctataa tgggacagac attgtctttt 360

79601-7270 Sequence Listing v2 -03-25-04.ST25

```

ccccctatgg cgattattgg agacaaacgc gtaaaatttg tctcttggaa ttgctcagtg      420
ccaaaaatgt taggtcattc agctcagtca gacgagatga agttttccat atgattgaat      480
ttttttcgat catcttctgg taagccagtt aatgtatcaa aaaggatttc tctattcaca      540
acctctatga catgtagatc agccttttgg caagaataca aggagcaaga cgaattcgca      600
caactagtaa aaaaagtgtc aagcttaatg gaagggtttg atgttgctga tatattccct      660
tcattgaagt ttcttcatgt gctcagtggg atgaaggcta aagttatgga tgcacaccat      720
gagttagatg ccattcttga aaaaattatc aatgagcaca agaaaattgc aactggaaaag      780
aataataatg aattaggagg tgaaggatta attgacgtac tgctaagact tatgaaagag      840
ggaggccttc aattcccgat caccaacgac aacatcaaag ctattatttt tgacatgttt      900
ggtgcgggaa cggaaacttc atcaaccaca attgactggg ccatggtcga aatgataaaag      960
aatccaagtg tattcgctaa agctcaagca gaggtaagag aagccttcag agagaaagaa    1020
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ttcagactcc atcctccatt tccccctttg ctccaagag aatctagaga agaaacagat    1140
ataaacggct acactattcc ttttaaaaca aaacttatgg ttaacgttcg ggctattgga    1200
agagatccaa aatattggga tgacgtggaa agttttaagc cagagagatt tgagcacaac    1260
tctatggatt ttattggtaa taattttgaa tatcttcctt ttggtagtgg aaggagaatg    1320
tgccctggga tatcatttgg tttggctaatt gtttatttgc cactagctca attgttatat    1380
cattttgatt ggaaactccc tactggaatc aattcaagtg acttggacat gactgagtcg    1440
tcaggagtaa cttgtgctag aaagagtgat ttataactga ctgctactcc atatcaactt    1500
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<210> 288  
 <211> 165  
 <212> PRT  
 <213> NICOTIANATABACUM

<400> 288

Met Gln Phe Phe Asn Phe Ile Ser Phe Val Phe Phe Val Ser Phe Leu  
 1 5 10 15

Phe Leu Leu Arg Lys Trp Lys Asn Ser Asn Ser Gln Thr Lys Arg Leu  
 20 25 30

Pro Pro Gly Pro Trp Lys Leu Pro Val Leu Gly Ser Met Phe His Leu  
 35 40 45

Leu Gly Gly Pro Pro His His Val Leu Gly Asp Leu Ala Lys Lys Tyr  
 50 55 60



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Gly Pro Leu Met His Leu Gln Leu Gly Glu Val Ser Val Val Ser Val  
65 70 75 80

Thr Ser Pro Glu Met Ala Lys Glu Val Leu Lys Thr His Asp Leu Ala  
85 90 95

Phe Ala Ser Arg Pro Leu Leu Leu Ala Ala Lys Ile Val Cys Tyr Asn  
100 105 110

Gly Thr Asp Ile Val Phe Ser Pro Tyr Gly Asp Tyr Trp Arg Gln Thr  
115 120 125

Arg Lys Ile Cys Leu Leu Glu Leu Leu Ser Ala Lys Asn Val Arg Ser  
130 135 140

Phe Ser Ser Val Arg Arg Asp Glu Val Phe His Met Ile Glu Phe Phe  
145 150 155 160

Ser Ile Ile Phe Trp  
165

<210> 289  
<211> 1592  
<212> DNA  
<213> NICOTIANATABACUM

<400> 289  
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aattggtctt ttctttgcca ttttaatcgc ttttaattgtc tctaaacttc gttcaaagcg 120  
ttttaagctt cctccaggac caattccagt accagttttt ggtaattggc ttcaagttgg 180  
tgatgattta aaccacagaa atcttactga ttatgccaaag aaatttggag atcttttctt 240  
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tttacacaca caaggtgttg aatttggttc aagaacaaga aatgttgtgt ttgatatttt 360  
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gagaattatg actgtaccat tttttactaa taaagttgtg caacagtata gaggggggtg 480  
ggagtttgag gtggcaagtg taattgagga tgtgaaaaaa aatcctgaat ctgctactaa 540  
tgggatcgta ttaaggagga gattacaatt aatgatgtat aataatatgt ttaggattat 600  
gtttgatagg agatttgaga gtgaagatga tcctttgttt gttaagctta aggctttgaa 660  
tggtgaaagg agtagattgg ctcaaagttt tgagtataat tatggtgatt ttattccaat 720  
tttgaggcct ttttttgaga ggttatttga agatctgtaa agaagttaag gagaagaggc 780  
tgcagctttt caaagattac tttgttgatg aaagaaagaa gctttcgaat accaagagct 840

## 79601-7270 Sequence Listing v2 -03-25-04.ST25

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cggacagcaa tggcctaata tgtgcgattg atcacattct tgaggctcaa cagaagggag    900
agatcaatga ggacaacggt ctttacattg ttgaaaacat caatgttgct gcaattgaaa    960
caacattatg gtcaattgag tggggtatcg ccgagctagt caaccaccct cacatccaaa   1020
agaaactgcg cgacgagatt gacacagttc ttggaccagg agtgcaagtg actgaaccag   1080
acaccacaaa gcttcctaac cttcaggctg tgatcaagga ggcacttcgt ctccgtatgg   1140
caattcctct attagtccca cacatgaacc ttcacgacgc aaagcttggc gggtttgata   1200
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ggaagaaacc cgaagagttc agacccgaga ggttccttga agaggagaag catgttgagc   1320
caatggcaat gacttcagat atcttccggt ttggcgttggg aggaggagct gccctggaat   1380
tataacttgc ttgccaactc ttggcatcac tttgggacgt ttggttcaga atgttgccctc   1440
ctccaggcca gtcgaagctc gacaccacag agaaaggtgg acagttcagt ctccacattt   1500
tgaagcattc caccattgtg ttgaaaccaa ggtctttctg aactttgtga tcttattaat   1560
taaggggttc tgaagaaatt tgatagtgtt gg                                1592

```

```

<210> 290
<211> 242
<212> PRT
<213> NICOTIANATABACUM

```

```

<400> 290

```

```

Met Asp Leu Leu Leu Leu Glu Lys Thr Leu Ile Gly Leu Phe Phe Ala
1          5          10          15

```

```

Ile Leu Ile Ala Leu Ile Val Ser Lys Leu Arg Ser Lys Arg Phe Lys
20          25          30

```

```

Leu Pro Pro Gly Pro Ile Pro Val Pro Val Phe Gly Asn Trp Leu Gln
35          40          45

```

```

Val Gly Asp Asp Leu Asn His Arg Asn Leu Thr Asp Tyr Ala Lys Lys
50          55          60

```

```

Phe Gly Asp Leu Phe Leu Leu Arg Met Gly Gln Arg Asn Leu Val Val
65          70          75          80

```

```

Val Ser Ser Pro Glu Leu Ala Lys Glu Val Leu His Thr Gln Gly Val
85          90          95

```

```

Glu Phe Gly Ser Arg Thr Arg Asn Val Val Phe Asp Ile Phe Thr Gly
100         105         110

```

79601-7270 Sequence Listing v2 -03-25-04.ST25

Lys Gly Gln Asp Met Val Phe Thr Val Tyr Gly Glu His Trp Arg Lys  
115 120 125

Met Arg Arg Ile Met Thr Val Pro Phe Phe Thr Asn Lys Val Val Gln  
130 135 140

Gln Tyr Arg Gly Gly Trp Glu Phe Glu Val Ala Ser Val Ile Glu Asp  
145 150 155 160

Val Lys Lys Asn Pro Glu Ser Ala Thr Asn Gly Ile Val Leu Arg Arg  
165 170 175

Arg Leu Gln Leu Met Met Tyr Asn Asn Met Phe Arg Ile Met Phe Asp  
180 185 190

Arg Arg Phe Glu Ser Glu Asp Asp Pro Leu Phe Val Lys Leu Lys Ala  
195 200 205

Leu Asn Gly Glu Arg Ser Arg Leu Ala Gln Ser Phe Glu Tyr Asn Tyr  
210 215 220

Gly Asp Phe Ile Pro Ile Leu Arg Pro Phe Phe Glu Arg Leu Phe Glu  
225 230 235 240

Asp Leu

<210> 291  
<211> 1544  
<212> DNA  
<213> NICOTIANATABACUM

<400> 291  
ataatgctct ttctactctt tgtagccctt cctttcattc ttatttttct tcttcctaaa 60  
ttcaaaaatg gtggaaataa cagattgccca ccaggctcta taggtttacc attcattgga 120  
aatttgcacat aatatgatag tataactcct catatctatt tttggaaact ttccaaaaaa 180  
tatggcaaaa tcttctcatt aaaacttgct tctactaatg tggtagtagt ttcttcagca 240  
aaattagcaa aagaagtatt gaaaaaaca gatttaatat tttgtagtag accatctatt 300  
cttgccaac aaaaactgtc ttattatggt cgtgatattg cttttgcacc ttataatgat 360  
tattggagag aaatgagaaa aatttgtgtt cttcatcttt ttagtttaaa aaaagttcaa 420  
ttatttagtc caattcgtga agatgaagtt tttagaatga ttaagaaaat atcaaaacaa 480  
gcttctactt cacaaattat taatttgagt aatttaatga tttcattaac aagtacaatt 540  
attttagtag ttgcttttgg tgttagggtt gaagaagaag cacatgcaag gaagagattt 600  
gattttcttt tggccgaggc acaagaaatg atggctagtt tctttgtatc tgattttttt 660

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```

ccctttttaa gttagattga caaattaagt ggattgacat atagacttga gaggaatttc 720
aaggatttgg ataattttta tgaagaactc attgagcaac atcaaaatcc taataagcca 780
aaatatatgg aaggagatat tgttgatcct ttgctacaat tgaagaaaga gaaattaaca 840
ccacttgatc tcactatgga agatataaaa ggaattctca tgaatgtgtt agttgcagga 900
tcagacacta gtgcagctgc tactgttttg gcaatgacag ccttgataaa gaatcctaaa 960
gccatggaaa aagttcaatt agaaatcaga aaatcagttg ggaagaaagg cattgtaaat 1020
gaagaagatg tccaaaacat cccttatttt aaagcagtga taaaggaaat atttagattg 1080
tatccaccag ctccactttt agttccaaga gaatcaatgg aaaaaacat attagaaggt 1140
tatgaaattc ggccaagaac catagtccat gttaacgctt gggctatagc aagggatcct 1200
gaaatatggg aaaatccaga tgaatttata cctgagagat ttttgaatag cagtatcgat 1260
tacaagggtc aagattttga gttacttcca tttggtgcag gcagaagagg ttgccaggt 1320
attgcacttg ggggtgcatc catggaactt gctttgtcaa atcttcttta tgcatttgat 1380
tgggagttgc cttatggagt gaaaaaagaa gacatcgaca caaacgtag gcctggaatt 1440
gccatgcaca agaaaaacga actttgcctt gtcccaaaaa aattatttat aaattatatt 1500
gggacgtgga tctcatgcta gttctgtgcg gtcagctaag ccta 1544

```

```

<210> 292
<211> 501
<212> PRT
<213> NICOTIANATABACUM

```

```
<400> 292
```

```
Met Leu Phe Leu Leu Phe Val Ala Leu Pro Phe Ile Leu Ile Phe Leu
1           5           10           15

```

```
Leu Pro Lys Phe Lys Asn Gly Gly Asn Asn Arg Leu Pro Pro Gly Pro
20           25           30

```

```
Ile Gly Leu Pro Phe Ile Gly Asn Leu His Gln Tyr Asp Ser Ile Thr
35           40           45

```

```
Pro His Ile Tyr Phe Trp Lys Leu Ser Lys Lys Tyr Gly Lys Ile Phe
50           55           60

```

```
Ser Leu Lys Leu Ala Ser Thr Asn Val Val Val Val Ser Ser Ala Lys
65           70           75           80

```

```
Leu Ala Lys Glu Val Leu Lys Lys Gln Asp Leu Ile Phe Cys Ser Arg
85           90           95

```

## 79601-7270 Sequence Listing v2 -03-25-04.ST25

Pro Ser Ile Leu Gly Gln Gln Lys Leu Ser Tyr Tyr Gly Arg Asp Ile  
 100 105 110  
 Ala Phe Ala Pro Tyr Trp Arg Glu Met Arg Lys Ile Cys Val Leu His  
 115 120 125  
 Leu Phe Ser Leu Lys Lys Val Gln Leu Phe Ser Pro Ile Arg Glu Asp  
 130 135 140  
 Glu Val Phe Arg Met Ile Lys Lys Ile Ser Lys Gln Ala Ser Thr Ser  
 145 150 155 160  
 Gln Ile Ile Asn Leu Ser Asn Leu Met Ile Ser Leu Thr Ser Thr Ile  
 165 170 175  
 Ile Cys Arg Val Ala Phe Gly Val Arg Phe Glu Glu Glu Ala His Ala  
 180 185 190  
 Arg Lys Arg Phe Asp Phe Leu Leu Ala Glu Ala Gln Glu Met Met Ala  
 195 200 205  
 Ser Phe Phe Val Ser Asp Phe Phe Pro Phe Leu Ser Ile Asp Lys Leu  
 210 215 220  
 Ser Gly Leu Thr Tyr Arg Leu Glu Arg Asn Phe Lys Asp Leu Asp Asn  
 225 230 235 240  
 Phe Tyr Glu Glu Leu Ile Glu Gln His Gln Asn Pro Asn Lys Pro Lys  
 245 250 255  
 Tyr Met Glu Gly Asp Ile Val Asp Leu Leu Leu Gln Leu Lys Lys Glu  
 260 265 270  
 Lys Leu Thr Pro Leu Asp Leu Thr Met Glu Asp Ile Lys Gly Ile Leu  
 275 280 285  
 Met Asn Val Leu Val Ala Gly Ser Asp Thr Ser Ala Ala Ala Thr Val  
 290 295 300  
 Trp Ala Met Thr Ala Leu Ile Lys Asn Pro Lys Ala Met Glu Lys Val  
 305 310 315 320  
 Gln Leu Glu Ile Arg Lys Ser Val Gly Lys Lys Gly Ile Val Asn Glu  
 325 330 335  
 Glu Asp Val Gln Asn Ile Pro Tyr Phe Lys Ala Val Ile Lys Glu Ile  
 340 345 350

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Phe Arg Leu Tyr Pro Pro Ala Pro Leu Leu Val Pro Arg Glu Ser Met  
355 360 365

Glu Lys Thr Ile Leu Glu Gly Tyr Glu Ile Arg Pro Arg Thr Ile Val  
370 375 380

His Val Asn Ala Trp Ala Ile Ala Arg Asp Pro Glu Ile Trp Glu Asn  
385 390 395 400

Pro Asp Glu Phe Ile Pro Glu Arg Phe Leu Asn Ser Ser Ile Asp Tyr  
405 410 415

Lys Gly Gln Asp Phe Glu Leu Leu Pro Phe Gly Ala Gly Arg Arg Gly  
420 425 430

Cys Pro Gly Ile Ala Leu Gly Val Ala Ser Met Glu Leu Ala Leu Ser  
435 440 445

Asn Leu Leu Tyr Ala Phe Asp Trp Glu Leu Pro Tyr Gly Val Lys Lys  
450 455 460

Glu Asp Ile Asp Thr Asn Val Arg Pro Gly Ile Ala Met His Lys Lys  
465 470 475 480

Asn Glu Leu Cys Leu Val Pro Lys Lys Leu Phe Ile Asn Tyr Ile Gly  
485 490 495

Thr Trp Ile Ser Cys  
500

<210> 293  
<211> 1764  
<212> DNA  
<213> NICOTIANATABACUM

<400> 293  
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aaaatattgt ccaaagctaa agattctttc tccttaaata gtcaacttta gtggttcctc 120  
ttcatttcat agctcaatct ttcttatttt gattcaacca tggagaacca atactcctac 180  
tcattctctt cctacttcta cttagctata gtactgtttc ttcttccaat tttggtcaaa 240  
tatttcttcc atcggagaag aaatttacct ccaagtccat tttctcttcc aataattggg 300  
cacctttacc ttctcaagaa aactctccat ctactctaa catccttatc agctaaatat 360  
ggtcctgttt tatacctcaa attgggctct atgcctgtga ttgttggtgc ctcaccatct 420  
gctgttgaag aatgtttaac caagaatgat atcatattcg caaataggcc caagaccgtg 480

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gctggtgaca agtttaccta caattatact gtttatgttt gggcacccta tggccaactt	540
tggagaattc ttcgccgatt aactgtcgtt gaactcttct cttcacatag cctacagaaa	600
acttctatcc ttagagatca agaagttgca atatttatcc gttcgttata caaattctca	660
aaggatagta gcaaaaaagt cgatttgacc aactggctctt ttactttggt tttcaatctt	720
atgaccaaaa ttattgctgg gagacatatt gtgaaggagg aagatgctgg caaggaaaag	780
ggcattgaaa ttattgaaaa acttagaggg actttcttag taactacatc attcttgaat	840
atgtgtgatt tcttgccagt attcaggtgg gttggttaca aagggctgga gaagaagatg	900
gcctcaattc acaatagaag aaatgaattc ttgaacagct tgcttgatga atttcgacac	960
aagaaaagta gtgcttcaca atctaacaca actgttggaa acatggagaa gaaaaccaca	1020
ctgattgaaa agctcttgct tcttcaagaa tcagagcctg aattctacac tgatgatata	1080
tcaaaagtat tatgctggta gtttttggtg caggaacaga gacctcatca acaaccatcc	1140
aatgggtaat gaggccttctt gtagctcacc ctgaggcatt gtataagcta cgagctgaca	1200
ttgacagtaa agttgggaat aagcgcttgc tgaatgaatc agacctcaac aagcttccgt	1260
atttgcatthg tgttgtaaat gagacaatga gattatacac tccgatacca cttttattgc	1320
ctcattattc aactaaagat tgtattgtgg aaggatatga tgtaccaaaa catacaatgt	1380
tgtttgtaaa cgcttgggcc attcacaggg atcccaaggt atgggaggag cctgacaagt	1440
tcaagccaga gagatttgag gcaacagaag gggaaacaga aaggttcaat tacaagcttg	1500
taccatttgg aatggggaga agagcgtgcc ctggagctga tatgggggtg cgagcagttt	1560
ctttggcatt aggtgcactt attcaatgct ttgactggca aattgaggaa gcggaaagct	1620
tggaggaaag ctataattct agaatgacta tgcagaacaa gcctttgaag gttgtctgca	1680
ctccacgcga agatcttggc cagcttctat cccaactcta aggcaattta tcaatgccaa	1740
acgtaatctt catctaccac tatg	1764

<210> 294  
 <211> 520  
 <212> PRT  
 <213> NICOTIANATABACUM

<400> 294

Met	Glu	Asn	Gln	Tyr	Ser	Tyr	Ser	Phe	Ser	Ser	Tyr	Phe	Tyr	Leu	Ala
1			5					10						15	

Ile	Val	Leu	Phe	Leu	Leu	Pro	Ile	Leu	Val	Lys	Tyr	Phe	Phe	His	Arg
		20					25						30		

Arg	Arg	Asn	Leu	Pro	Pro	Ser	Pro	Phe	Ser	Leu	Pro	Ile	Ile	Gly	His
		35					40					45			

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Leu Tyr Leu Leu Lys Lys Thr Leu His Leu Thr Leu Thr Ser Leu Ser  
 50 55 60  
 Ala Lys Tyr Gly Pro Val Leu Tyr Leu Lys Leu Gly Ser Met Pro Val  
 65 70 75 80  
 Ile Val Val Ser Ser Pro Ser Ala Val Glu Glu Cys Leu Thr Lys Asn  
 85 90 95  
 Asp Ile Ile Phe Ala Asn Arg Pro Lys Thr Val Ala Gly Asp Lys Phe  
 100 105 110  
 Thr Tyr Asn Tyr Thr Val Tyr Val Trp Ala Pro Tyr Gly Gln Leu Trp  
 115 120 125  
 Arg Ile Leu Arg Arg Leu Thr Val Val Glu Leu Phe Ser Ser His Ser  
 130 135 140  
 Leu Gln Lys Thr Ser Ile Leu Arg Asp Gln Glu Val Ala Ile Phe Ile  
 145 150 155 160  
 Arg Ser Leu Tyr Lys Phe Ser Lys Asp Ser Ser Lys Lys Val Asp Leu  
 165 170 175  
 Thr Asn Trp Ser Phe Thr Leu Val Phe Asn Leu Met Thr Lys Ile Ile  
 180 185 190  
 Ala Gly Arg His Ile Val Lys Glu Glu Asp Ala Gly Lys Glu Lys Gly  
 195 200 205  
 Ile Glu Ile Ile Glu Lys Leu Arg Gly Thr Phe Leu Val Thr Thr Ser  
 210 215 220  
 Phe Leu Asn Met Cys Asp Phe Leu Pro Val Phe Arg Trp Val Gly Tyr  
 225 230 235 240  
 Lys Gly Leu Glu Lys Lys Met Ala Ser Ile His Asn Arg Arg Asn Glu  
 245 250 255  
 Phe Leu Asn Ser Leu Leu Asp Glu Phe Arg His Lys Lys Ser Ser Ala  
 260 265 270  
 Ser Gln Ser Asn Thr Thr Val Gly Asn Met Glu Lys Lys Thr Thr Leu  
 275 280 285  
 Ile Glu Lys Leu Leu Ser Leu Gln Glu Ser Glu Pro Glu Phe Tyr Thr  
 290 295 300



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Asp Asp Ile Ile Lys Ser Ile Met Leu Val Val Phe Val Ala Gly Thr  
305 310 315 320

Glu Thr Ser Ser Thr Thr Ile Gln Trp Val Met Arg Leu Leu Val Ala  
325 330 335

His Pro Glu Ala Leu Tyr Lys Leu Arg Ala Asp Ile Asp Ser Lys Val  
340 345 350

Gly Asn Lys Arg Leu Leu Asn Glu Ser Asp Leu Asn Lys Leu Pro Tyr  
355 360 365

Leu His Cys Val Val Asn Glu Thr Met Arg Leu Tyr Thr Pro Ile Pro  
370 375 380

Leu Leu Leu Pro His Tyr Ser Thr Lys Asp Cys Ile Val Glu Gly Tyr  
385 390 395 400

Asp Val Pro Lys His Thr Met Leu Phe Val Asn Ala Trp Ala Ile His  
405 410 415

Arg Asp Pro Lys Val Trp Glu Glu Pro Asp Lys Phe Lys Pro Glu Arg  
420 425 430

Phe Glu Ala Thr Glu Gly Glu Thr Glu Arg Phe Asn Tyr Lys Leu Val  
435 440 445

Pro Phe Gly Met Gly Arg Arg Ala Cys Pro Gly Ala Asp Met Gly Leu  
450 455 460

Arg Ala Val Ser Leu Ala Leu Gly Ala Leu Ile Gln Cys Phe Asp Trp  
465 470 475 480

Gln Ile Glu Glu Ala Glu Ser Leu Glu Glu Ser Tyr Asn Ser Arg Met  
485 490 495

Thr Met Gln Asn Lys Pro Leu Lys Val Val Cys Thr Pro Arg Glu Asp  
500 505 510

Leu Gly Gln Leu Leu Ser Gln Leu  
515 520

<210> 295  
<211> 1694  
<212> DNA  
<213> NICOTIANATABACUM

## 79601-7270 Sequence Listing v2 -03-25-04.ST25

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<400> 295
aacatccttt ccttcttcca aaaatggagc ttcaatcttc tcctttcaat ttaatttctt    60
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agttacctcc aggtccgtgg aggccttcct ttattggaag cctccatcac ttgaaggga    180
aacttccaca ccataatctt agagatctag cgcgaaaata tggacctctc atgtacttac    240
aactcggaga aattcctgta gttgtaatat cttcgccacg ttagcaaaa gctgtactaa    300
aaactcatga tctcgctttt gcaactagac cacgattcat gtcctcagac attgtgtttt    360
acaaaagcag ggacatctct tttgccccat ttggtgatta ctggagacag atgcgtaaaa    420
tattgactca ggaactcctg agcaacaaga tgctcaagtc atatagctta atccgaaagg    480
atgagctctc gaagctctc tcatcgattc gtttggaaac aggttctgca gtgaacataa    540
atgaaaagct tctctggttt acgagctgca tgacctgtag attagccttt ggaaaaatat    600
gcaatgatcg ggatgagttg atcatgctaa ttagggagat attaacatta tcaggaggat    660
ttgatgtggg tgatttgttc ctttcctgga aattacttca taatatgagc aacatgaaag    720
ctaggttgac gaatgtacac cacaagtatg atttagttat ggagaacatc atcaatgagc    780
accaagagaa tcatgcagca gggataaagg gtaacaacga gtttgggtggc gaagatatga    840
tcgatgctct actgagggtc aaggagaata atgagcttca atttcctatc gaaaatgaca    900
acatgaaagc agtaattctg gacttgttta ttgctggaac tgaaacttca tatactgcaa    960
ttatatgggc actatcagaa ttgatgaagc acccaagtgt gatggccaag gcacaagctg   1020
aagtgagaaa agtcttcaaa gaaaatgaaa atttcgacga aaatgatctt gacaagttgc   1080
catacctaaa atcagtgatt aaagaaacac taaggatgca ccctccagtt cctttgttag   1140
ggcctagaga atgcaggggac caaacagaga tcgatggcta cactgtacct attaaagcta   1200
gagttatggg taatgcttgg gcgataggaa gagatcctga aagtgggaa gatcctgaaa   1260
gtttcaaacc ggagcgattt gaaaatactt ctgttgatct tacaggaaat cactatcagt   1320
tcattccttt cggttcagga agaagaatgt gtccaggaat gtcgtttggg ttagttaaca   1380
cagggcatcc tttagcccag ttgctctatt gctttgactg gaaactccct gacaaggtta   1440
atgcaaatga ttttcgcact actgaaacaa gtagagtttt tgcagcaagc aaagatgacc   1500
tctacttgat tcccacaaat cacagggagc aagaatagct taatttaatg gagttcttgg   1560
aagaattaaa gaagaagggc tatataggtg agattttttg tatggttgca aggtttttag   1620
ttcatacaat aagacaatac atttatattc agtattgtgt atcatgtata ataaggttcc   1680
ttttgtttaa aaaa                                           1694

```

```

<210> 296
<211> 504
<212> PRT

```

&lt;213&gt; NICOTIANATABACUM

&lt;400&gt; 296

Met Glu Leu Gln Ser Ser Pro Phe Asn Leu Ile Ser Leu Phe Leu Phe  
 1 5 10 15

Phe Ser Phe Leu Phe Ile Leu Val Lys Lys Trp Asn Ala Lys Ile Pro  
 20 25 30

Lys Leu Pro Pro Gly Pro Trp Arg Leu Pro Phe Ile Gly Ser Leu His  
 35 40 45

His Leu Lys Gly Lys Leu Pro His His Asn Leu Arg Asp Leu Ala Arg  
 50 55 60

Lys Tyr Gly Pro Leu Met Tyr Leu Gln Leu Gly Glu Ile Pro Val Val  
 65 70 75 80

Val Ile Ser Ser Pro Arg Val Ala Lys Ala Val Leu Lys Thr His Asp  
 85 90 95

Leu Ala Phe Ala Thr Arg Pro Arg Phe Met Ser Ser Asp Ile Val Phe  
 100 105 110

Tyr Lys Ser Arg Asp Ile Ser Phe Ala Pro Phe Gly Asp Tyr Trp Arg  
 115 120 125

Gln Met Arg Lys Ile Leu Thr Gln Glu Leu Leu Ser Asn Lys Met Leu  
 130 135 140

Lys Ser Tyr Ser Leu Ile Arg Lys Asp Glu Leu Ser Lys Leu Leu Ser  
 145 150 155 160

Ser Ile Arg Leu Glu Thr Gly Ser Ala Val Asn Ile Asn Glu Lys Leu  
 165 170 175

Leu Trp Phe Thr Ser Cys Met Thr Cys Arg Leu Ala Phe Gly Lys Ile  
 180 185 190

Cys Asn Asp Arg Asp Glu Leu Ile Met Leu Ile Arg Glu Ile Leu Thr  
 195 200 205

Leu Ser Gly Gly Phe Asp Val Gly Asp Leu Phe Pro Ser Trp Lys Leu  
 210 215 220

Leu His Asn Met Ser Asn Met Lys Ala Arg Leu Thr Asn Val His His  
 225 230 235 240

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Lys Tyr Asp Leu Val Met Glu Asn Ile Ile Asn Glu His Gln Glu Asn  
 245 250 255  
 His Ala Ala Gly Ile Lys Gly Asn Asn Glu Phe Gly Gly Glu Asp Met  
 260 265 270  
 Ile Asp Ala Leu Leu Arg Ala Lys Glu Asn Asn Glu Leu Gln Phe Pro  
 275 280 285  
 Ile Glu Asn Asp Asn Met Lys Ala Val Ile Leu Asp Leu Phe Ile Ala  
 290 295 300  
 Gly Thr Glu Thr Ser Tyr Thr Ala Ile Ile Trp Ala Leu Ser Glu Leu  
 305 310 315 320  
 Met Lys His Pro Ser Val Met Ala Lys Ala Gln Ala Glu Val Arg Lys  
 325 330 335  
 Val Phe Lys Glu Asn Glu Asn Phe Asp Glu Asn Asp Leu Asp Lys Leu  
 340 345 350  
 Pro Tyr Leu Lys Ser Val Ile Lys Glu Thr Leu Arg Met His Pro Pro  
 355 360 365  
 Val Pro Leu Leu Gly Pro Arg Glu Cys Arg Asp Gln Thr Glu Ile Asp  
 370 375 380  
 Gly Tyr Thr Val Pro Ile Lys Ala Arg Val Met Val Asn Ala Trp Ala  
 385 390 395 400  
 Ile Gly Arg Asp Pro Glu Ser Trp Glu Asp Pro Glu Ser Phe Lys Pro  
 405 410 415  
 Glu Arg Phe Glu Asn Thr Ser Val Asp Leu Thr Gly Asn His Tyr Gln  
 420 425 430  
 Phe Ile Pro Phe Gly Ser Gly Arg Arg Met Cys Pro Gly Met Ser Phe  
 435 440 445  
 Gly Leu Val Asn Thr Gly His Pro Leu Ala Gln Leu Leu Tyr Cys Phe  
 450 455 460  
 Asp Trp Lys Leu Pro Asp Lys Val Asn Ala Asn Asp Phe Arg Thr Thr  
 465 470 475 480  
 Glu Thr Ser Arg Val Phe Ala Ala Ser Lys Asp Asp Leu Tyr Leu Ile  
 485 490 495

## 79601-7270 Sequence Listing v2 -03-25-04.ST25

Pro Thr Asn His Arg Glu Gln Glu  
500

<210> 297  
<211> 1819  
<212> DNA  
<213> NICOTIANATABACUM

<400> 297  
caatcagtgg atgcgggagt aatatataat atgcaagttg tagaaagaga aaaaaaaaaat 60  
caagtagcta ttctatactg gggcacaaat agtgagtga aatggagact gttcaaatca 120  
taataacagc atcttgtgct gccataataa ttactctagt ggtgtgtatt tggagagtac 180  
tgaattgggt ttggttcaga ccaaagaagc tggaaaaact attgaggaaa caaggtctca 240  
aaggaactc ctacaagatt ttgtatgggg atatgaagga gctttctggg atgattaagg 300  
aagctaattc caaacccatg aatctttctg atgatattgc accaagattg gtgcctttct 360  
ttcttgacac catcaagaaa tatggtaaaa aatcctttgt atggttagggt ccgaaaccac 420  
tggttcttat catggaccct gagcttataa aggaaatatt ttccaaatac tatctgtatc 480  
aaaagcctca tggaaatcca gttaccaagc tattagtaca aggactagta agcctagagg 540  
aagacaaatg ggccaaacat agaaaaatca tcaatccagc tttccatcta gagaagctaa 600  
agcatatgct tccagctttt tgcttgagct gcactgagat gctgtgcaaa tgggaagata 660  
ttgtttcaat taaggggtca catgagatag atgtatggcc tcaccttgaa caattaagta 720  
gcgatgtgat ctctcggaca gcttttgcca gtaactttga agaaggtaaa aggatatttg 780  
aacttcagaa ggaacaagct cagtattttg tagaagctat acgctcgggt tatataccag 840  
gctggagggt tttgccaaca aagaggaaca gaagaatgaa ggaagtgaa aaggatgttc 900  
gggcctcgat aagaggcatt attgataaaa gagtgaaggc aatgaaagca ggagaggcga 960  
gtaatgagga tctacttggg atattgttgg aatctaattt tacagaagct gaacagcata 1020  
gacacaagga ttctgcgatg agcattgaag aagtcattca agaagtgcaag ttattctatg 1080  
ttgctggcca agaaactaca tcagtgttgc ttgtgtggac tctaattattg ttgagtaggc 1140  
atcaagattg gcagagccga gccagagaag aggtgtttca agtctttggg aatcagaaac 1200  
cagattttga cggattgaat cgtctaaaag ttgtgacaat gatcttgat gagtctttta 1260  
ggctatactc cccagtagtg tcaactaatcc ggcggcctaa tgaggatgct atattaggaa 1320  
atgtatctct gccagaagggt gtgctactct cattaccagt gatcttatta caccacgatg 1380  
aagagatatg gggtaaagat gcaaagaagt tcaatccaga aagatttaga gatggagtct 1440  
caagtgaac aaaggggtcaa gtcacttttt ttccatttac ttgggggtccc agaatatgca 1500  
tcggacaaaa ttttgccatg ttagaagcaa agactgcttt ggctatgatc ctacaacgct 1560

## 79601-7270 Sequence Listing v2 -03-25-04.ST25

```

tctcattcga actgtctcca tcttatgcac atgctcctca gtccatatta actatgcaac 1620
cccaacatgg tgctccacta attctgcaca aaatatagtt tgttacttta agcagtgtct 1680
tgttatatgt cagagagtcc aaaaatgttta attaaggctt gtagaactgc caaatggaac 1740
ttcatttgca ttcgtggggt gtagattggt gtaattggac aagtatactg tttatttttag 1800
agttttaaga aaaaaaaaaa 1819

```

```

<210> 298
<211> 518
<212> PRT
<213> NICOTIANATABACUM

```

```

<400> 298

```

```

Met Glu Thr Val Gln Ile Ile Ile Thr Ala Ser Cys Ala Ala Ile Ile
1          5          10          15

```

```

Ile Thr Leu Val Val Cys Ile Trp Arg Val Leu Asn Trp Val Trp Phe
20          25          30

```

```

Arg Pro Lys Lys Leu Glu Lys Leu Leu Arg Lys Gln Gly Leu Lys Gly
35          40          45

```

```

Asn Ser Tyr Lys Ile Leu Tyr Gly Asp Met Lys Glu Leu Ser Gly Met
50          55          60

```

```

Ile Lys Glu Ala Asn Ser Lys Pro Met Asn Leu Ser Asp Asp Ile Ala
65          70          75          80

```

```

Pro Arg Leu Val Pro Phe Phe Leu Asp Thr Ile Lys Lys Tyr Gly Lys
85          90          95

```

```

Lys Ser Phe Val Trp Leu Gly Pro Lys Pro Leu Val Leu Ile Met Asp
100          105          110

```

```

Pro Glu Leu Ile Lys Glu Ile Phe Ser Lys Tyr Tyr Leu Tyr Gln Lys
115          120          125

```

```

Pro His Gly Asn Pro Val Thr Lys Leu Leu Val Gln Gly Leu Val Ser
130          135          140

```

```

Leu Glu Glu Asp Lys Trp Ala Lys His Arg Lys Ile Ile Asn Pro Ala
145          150          155          160

```

```

Phe His Leu Glu Lys Leu Lys His Met Leu Pro Ala Phe Cys Leu Ser
165          170          175

```

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Cys Thr Glu Met Leu Cys Lys Trp Glu Asp Ile Val Ser Ile Lys Gly  
180 185 190

Ser His Glu Ile Asp Val Trp Pro His Leu Glu Gln Leu Ser Ser Asp  
195 200 205

Val Ile Ser Arg Thr Ala Phe Gly Ser Asn Phe Glu Glu Gly Lys Arg  
210 215 220

Ile Phe Glu Leu Gln Lys Glu Gln Ala Gln Tyr Phe Val Glu Ala Ile  
225 230 235 240

Arg Ser Val Tyr Ile Pro Gly Trp Arg Phe Leu Pro Thr Lys Arg Asn  
245 250 255

Arg Arg Met Lys Glu Val Glu Lys Asp Val Arg Ala Ser Ile Arg Gly  
260 265 270

Ile Ile Asp Lys Arg Val Lys Ala Met Lys Ala Gly Glu Ala Ser Asn  
275 280 285

Glu Asp Leu Leu Gly Ile Leu Leu Glu Ser Asn Phe Thr Glu Ala Glu  
290 295 300

Gln His Arg His Lys Asp Ser Ala Met Ser Ile Glu Glu Val Ile Gln  
305 310 315 320

Glu Cys Lys Leu Phe Tyr Val Ala Gly Gln Glu Thr Thr Ser Val Leu  
325 330 335

Leu Val Trp Thr Leu Ile Leu Leu Ser Arg His Gln Asp Trp Gln Ser  
340 345 350

Arg Ala Arg Glu Glu Val Phe Gln Val Phe Gly Asn Gln Lys Pro Asp  
355 360 365

Phe Asp Gly Leu Asn Arg Leu Lys Val Val Thr Met Ile Leu Tyr Glu  
370 375 380

Ser Leu Arg Leu Tyr Ser Pro Val Val Ser Leu Ile Arg Arg Pro Asn  
385 390 395 400

Glu Asp Ala Ile Leu Gly Asn Val Ser Leu Pro Glu Gly Val Leu Leu  
405 410 415

Ser Leu Pro Val Ile Leu Leu His His Asp Glu Glu Ile Trp Gly Lys  
420 425 430

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Asp Ala Lys Lys Phe Asn Pro Glu Arg Phe Arg Asp Gly Val Ser Ser  
 435 440 445

Ala Thr Lys Gly Gln Val Thr Phe Phe Pro Phe Thr Trp Gly Pro Arg  
 450 455 460

Ile Cys Ile Gly Gln Asn Phe Ala Met Leu Glu Ala Lys Thr Ala Leu  
 465 470 475 480

Ala Met Ile Leu Gln Arg Phe Ser Phe Glu Leu Ser Pro Ser Tyr Ala  
 485 490 495

His Ala Pro Gln Ser Ile Leu Thr Met Gln Pro Gln His Gly Ala Pro  
 500 505 510

Leu Ile Leu His Lys Ile  
 515